UK MET OFFICE
GLOBAL DATA MONITORING REPORT

February 2004

Data Assimilation
Meteorological Office
Fitzroy Rd
Exeter
Devon
EX1 3PB

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Exeter. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Exeter in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

Mr. D. Richardson
Observations Data Monitoring Group
Met Office
Fitzroy Road
Exeter
Devon
United Kingdom
EX1 3PB

2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Exeter and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Exeter and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Exeter and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbitting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Exeter during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Exeter in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Exeter from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.
27. November 2003. Included temperature and relative humidity statistics for ships, fixed buoys and platforms in Table 1.
28. November 2003. NOAA 17 statistics no longer available due to malfunction of the AMSU-A instrument.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees). :Air temperature (Degrees C). :Relative Humidity (%). :Sea surface temperature (Degrees).
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:15 degrees (air temperature)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
	≥ 4 degrees	(air temperature)
	≥ 15%	(relative humidity)
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
	≥ 6 degrees	(air temperature)
	≥ 25%	(relative humidity)
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
DMRX	P	27	0	56	1.3	4.3	4.5
H9LW	P	52	4	67	1.7	4.7	5.0
LAVX4	P	37	30	35	2.7	0.0	2.7
LAVY4	P	43	26	26	2.0	0.1	2.0
OYKJ2	P	31	0	0	1.9	4.1	4.5
PJWE	P	20	0	10	0.6	4.0	4.1
SXVF	P	37	0	19	2.6	5.4	6.0
TEST	P	108	98	100	0.1	-13.8	13.8
UDYN	P	20	0	45	1.1	-4.1	4.2
VQEN2	P	25	0	76	1.9	5.9	6.1
VRYO2	P	35	0	63	2.3	5.2	5.6
VTXK	P	36	3	44	2.3	5.9	6.4
WCY7054	P	26	4	62	1.5	6.9	7.1
WDJK	P	51	0	2	1.6	-4.8	5.1
WSRH	P	59	0	5	2.3	-4.5	5.0
3FPS9	P	23	0	4	1.9	-4.1	4.5
31056	P	40	67	85	5.9	-3.2	6.7
62166	P	59	0	100	4.3	6.4	7.7

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CO2	SPEED	41	2	12	3.2	6.1	6.9
C6JS	SPEED	44	0	100	3.1	5.1	6.0
DGZO	SPEED	30	0	100	5.3	5.5	7.7
ELZF9	SPEED	33	3	100	8.2	7.2	11.0
FNNO	SPEED	22	0	100	4.7	5.0	6.8
LACR5	SPEED	30	3	7	2.5	5.0	5.6
LAQJ4	SPEED	20	0	40	4.8	9.5	10.6
LMWR3	SPEED	39	0	3	2.9	5.1	5.9
OXRA6	SPEED	20	0	100	3.1	5.0	5.8
PDYX	SPEED	20	30	45	2.0	-1.4	2.5
SWYM	SPEED	21	14	100	2.5	5.2	5.8
TSMU	SPEED	39	8	100	5.8	9.6	11.2
VEP717	SPEED	218	0	2	3.6	5.1	6.2
VRWG6	SPEED	21	0	5	5.6	5.5	7.8
V2MH	SPEED	36	0	14	3.8	5.2	6.5
3FRA8	SPEED	43	0	28	5.6	5.6	7.9

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
AVOSTEST	DIRN.	49	12	0	114.6	-58.9	128.8
GRFP	DIRN.	35	0	0	16.3	-32.0	35.9
46084	DIRN.	68	18	0	55.1	-50.8	75.0

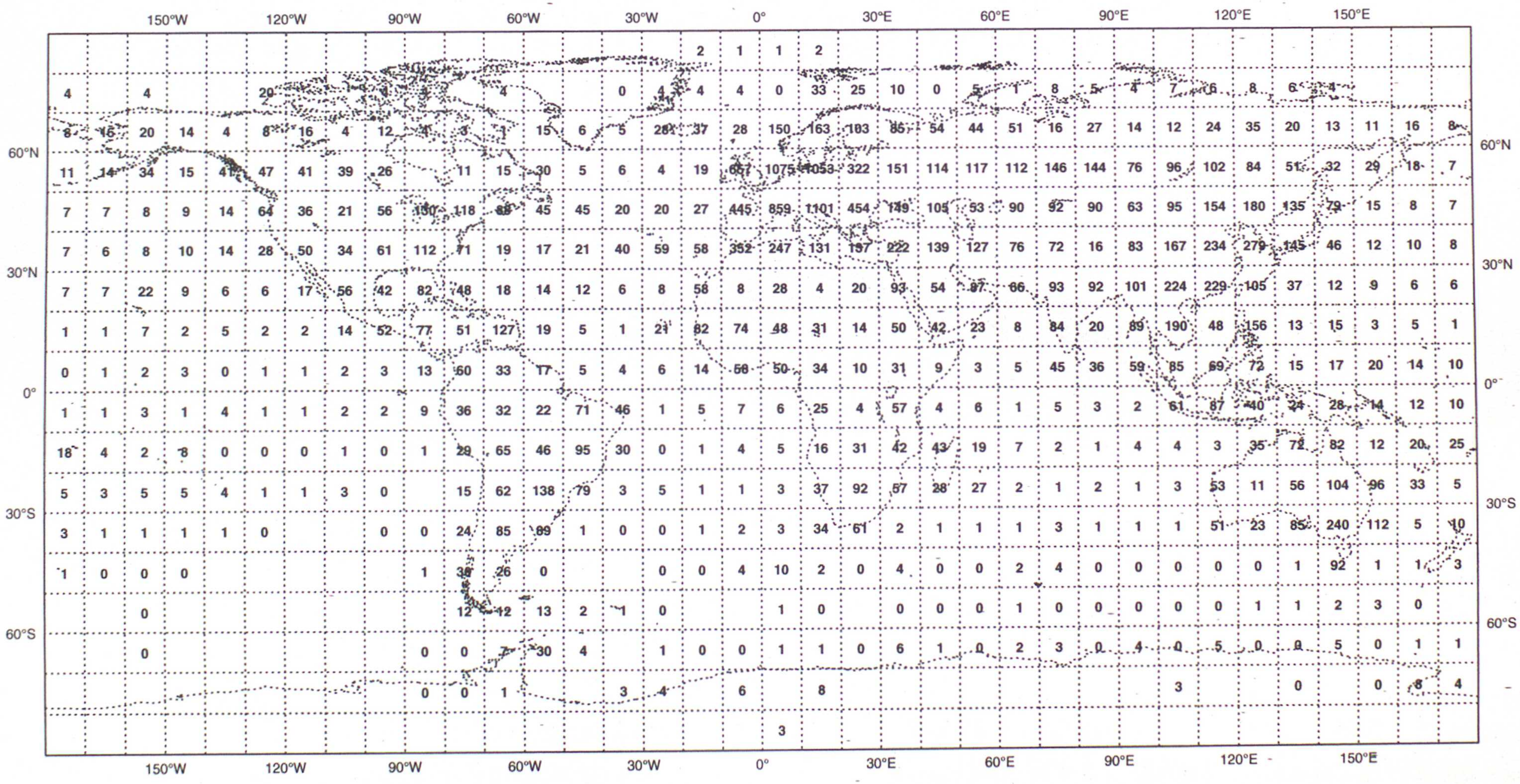
IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CGDT	T	203	2	100	1.8	-11.2	11.3
D5XH	T	20	0	100	2.5	4.6	5.2
KS034	T	155	18	100	3.8	9.7	10.5
SP32	T	113	19	100	4.3	-9.0	10.0
TEST	T	109	25	100	6.0	3.9	7.2
UBNY	T	25	0	100	3.9	-4.0	5.6
UCJJ	T	34	0	100	3.1	-5.0	5.9
UDUK	T	26	0	100	1.9	4.1	4.5
UFAA	T	36	0	100	1.7	5.2	5.4
UGGA	T	47	0	100	3.7	-5.1	6.3
WWU8	T	22	5	100	3.6	6.1	7.1
46081	T	675	0	100	3.2	5.5	6.4

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CGDX	RH	28	0	100	15.3	-26.1	30.3
CGSB	RH	213	0	100	15.6	-17.6	23.5
DBJM	RH	589	0	100	10.9	17.2	20.4
FNAT	RH	67	0	100	7.7	23.9	25.1
GJMP	RH	35	0	100	11.1	15.8	19.3

GUTF	RH	33	0	100	9.0	15.0	17.5
HUON	RH	20	0	100	8.9	15.7	18.0
JBGY	RH	38	0	100	9.5	17.0	19.5
V2RA	RH	27	0	100	7.6	22.0	23.2
V7DQ8	RH	46	0	100	6.0	18.5	19.5
XXUU	RH	65	0	100	9.3	19.4	21.5
ZKWG	RH	41	0	100	12.4	16.6	20.7
ZSWAV1	RH	41	0	100	7.9	-39.0	39.8
3EZF5	RH	62	0	100	10.5	22.3	24.6
44007	RH	663	0	100	11.6	-15.6	19.4
62123	RH	20	0	100	6.4	28.3	29.0
62402	RH	50	0	100	11.6	-16.2	19.9

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CG3	SST	33	0	36	3.5	-3.0	4.6
C6YW	SST	22	23	100	1.0	-3.7	3.8
ELZT3	SST	610	92	102	0.4	-0.1	0.4
KHRC	SST	41	0	100	1.0	-3.0	3.2
KHRH	SST	26	0	50	1.5	-3.2	3.5
LAJV4	SST	31	0	100	1.2	4.4	4.5
LAVX4	SST	26	38	58	1.4	3.1	3.4
OWTW2	SST	23	0	100	1.3	3.4	3.6
PCER	SST	24	0	58	3.0	3.0	4.3
P3GT9	SST	29	3	83	1.6	-3.6	4.0
S6IW	SST	36	0	100	2.9	4.7	5.5
UAMY	SST	41	0	63	2.1	-3.2	3.9
UCJO	SST	27	0	70	3.0	-3.8	4.9
UCOL	SST	34	0	59	2.0	-3.2	3.8
UHRT	SST	30	0	100	1.1	-3.6	3.8
UHVW	SST	30	0	100	0.7	3.2	3.3
UIMH	SST	32	13	103	1.5	-6.5	6.7
VOCJ	SST	207	93	100	0.6	9.0	9.0
V2OH1	SST	30	0	100	1.8	-4.9	5.2
V7DN3	SST	41	2	100	2.5	-4.0	4.7
WAAH	SST	41	0	100	1.6	3.0	3.4
WCZ9380	SST	34	0	94	0.9	5.1	5.2
WDCJ	SST	26	0	50	2.4	-3.6	4.3
ZCBH8	SST	24	79	83	3.9	-2.2	4.5
ZCBU5	SST	39	0	100	0.8	3.4	3.5
3FHT4	SST	29	0	72	2.5	6.1	6.6
31056	SST	38	89	100	0.7	-3.4	3.5
41008	SST	668	0	100	0.5	-4.7	4.7
41025	SST	669	6	77	6.1	-1.6	6.4
42007	SST	668	0	100	0.8	-3.8	3.9

Figure 1. SHIP/SYNOP mean daily count. FEBRUARY 2004
All hours
Global average number of observations in 24 hours = 21378


150°W
120°W
90°W
60°W
30°W
0°
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60°N
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2 1 1 2
4 4 20 4 4 0 4 4 4 0 33 25 10 0 5 1 8 5 4 7 6 8 6 4
8 16 20 14 4 8 16 4 12 4 3 1 15 6 5 28 37 28 150 163 103 85 54 44 51 16 27 14 12 24 35 20 13 11 16 8
11 14 34 15 41 47 41 39 26 11 15 30 5 6 4 19 657 1075 1053 322 151 114 117 112 146 144 76 96 102 84 51 32 29 18 7
7 7 8 9 14 64 36 21 56 150 118 68 45 45 20 20 27 445 859 1101 454 149 105 53 90 92 90 63 95 154 180 135 79 15 8 7
7 6 8 10 14 28 50 34 61 112 71 19 17 21 40 59 58 352 247 131 187 222 139 127 76 72 16 83 167 234 279 145 46 12 10 8
7 7 22 9 6 6 17 56 42 82 48 18 14 12 6 8 58 8 28 4 20 93 54 87 66 93 92 101 224 229 105 37 12 9 6 6
1 1 7 2 5 2 2 14 52 77 51 127 19 5 1 21 82 74 48 31 14 50 42 23 8 84 20 89 190 48 156 13 15 3 5 1
0 1 2 3 0 1 1 2 3 13 60 33 17 5 4 6 14 56 50 34 10 31 9 3 5 45 36 59 85 69 72 15 17 20 14 10
1 1 3 1 4 1 1 2 2 9 36 32 22 71 46 1 5 7 6 25 4 57 4 6 1 5 3 2 61 87 40 24 28 14 12 10
18 4 2 8 0 0 0 1 0 1 29 65 46 95 30 0 1 4 5 16 31 42 43 19 7 2 1 4 4 3 35 72 82 12 20 25
5 3 5 5 4 1 1 3 0 15 62 138 79 3 5 1 1 3 37 92 57 28 27 2 1 2 1 3 53 11 56 104 96 33 5
3 1 1 1 1 0 0 0 24 85 89 1 0 0 1 2 3 34 61 2 1 1 1 3 1 1 1 51 23 85 240 112 5 10
1 0 0 0 1 38 26 0 0 0 4 10 2 0 4 0 0 2 4 0 0 0 0 0 1 92 1 1 3
0 12 12 13 2 1 0 1 0 0 0 0 1 0 0 0 0 0 1 1 2 3 0
0 0 0 7 30 4 1 0 0 1 1 0 6 1 0 2 3 0 4 0 5 0 0 5 0 1 1
0 0 1 3 4 6 8 3 0 0 8 4
3

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times : All hours

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).
:Sea surface temperature (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ : Percentage of observations flagged excluding those with gross errors

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
44616	53.2	-41.0	P	34	32	76	4.9	-5.7	7.5
44768	57.9	-48.3	P	35	9	63	3.4	5.3	6.3
46710	39.5	-150.5	P	21	0	76	2.1	-5.9	6.2
71614	-60.4	-55.4	P	148	32	32	0.4	0.4	0.6

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
41595	26.2	-38.1	DIRN.	248	0	0	18.2	-35.9	40.2
52651	22.7	143.5	DIRN.	330	0	0	44.9	-37.2	58.3

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
31505	-4.2	-36.7	SST	160	29	35	1.3	-0.3	1.3
32693	5.3	-125.9	SST	518	0	100	0.2	3.1	3.1
33502	-32.9	-14.5	SST	102	0	100	0.7	4.4	4.5
33566	-25.6	93.4	SST	247	36	42	1.6	-0.8	1.8
41611	36.1	-71.7	SST	163	0	61	2.9	3.5	4.5
44508	42.0	-52.3	SST	113	0	80	3.1	-3.2	4.5
44626	39.6	-64.3	SST	182	0	84	1.8	-5.1	5.4
46972	17.7	-173.2	SST	154	0	100	0.2	4.5	4.5
53591	33.6	130.1	SST	75	0	100	0.3	-3.4	3.4
53594	21.2	113.9	SST	30	0	73	2.6	-4.5	5.2
56532	-60.9	171.3	SST	197	0	65	0.9	3.2	3.4

Figure 2. DRIFTER mean daily count. FEBRUARY 2004
All hours
Global average number of observations in 24 hours = 11206

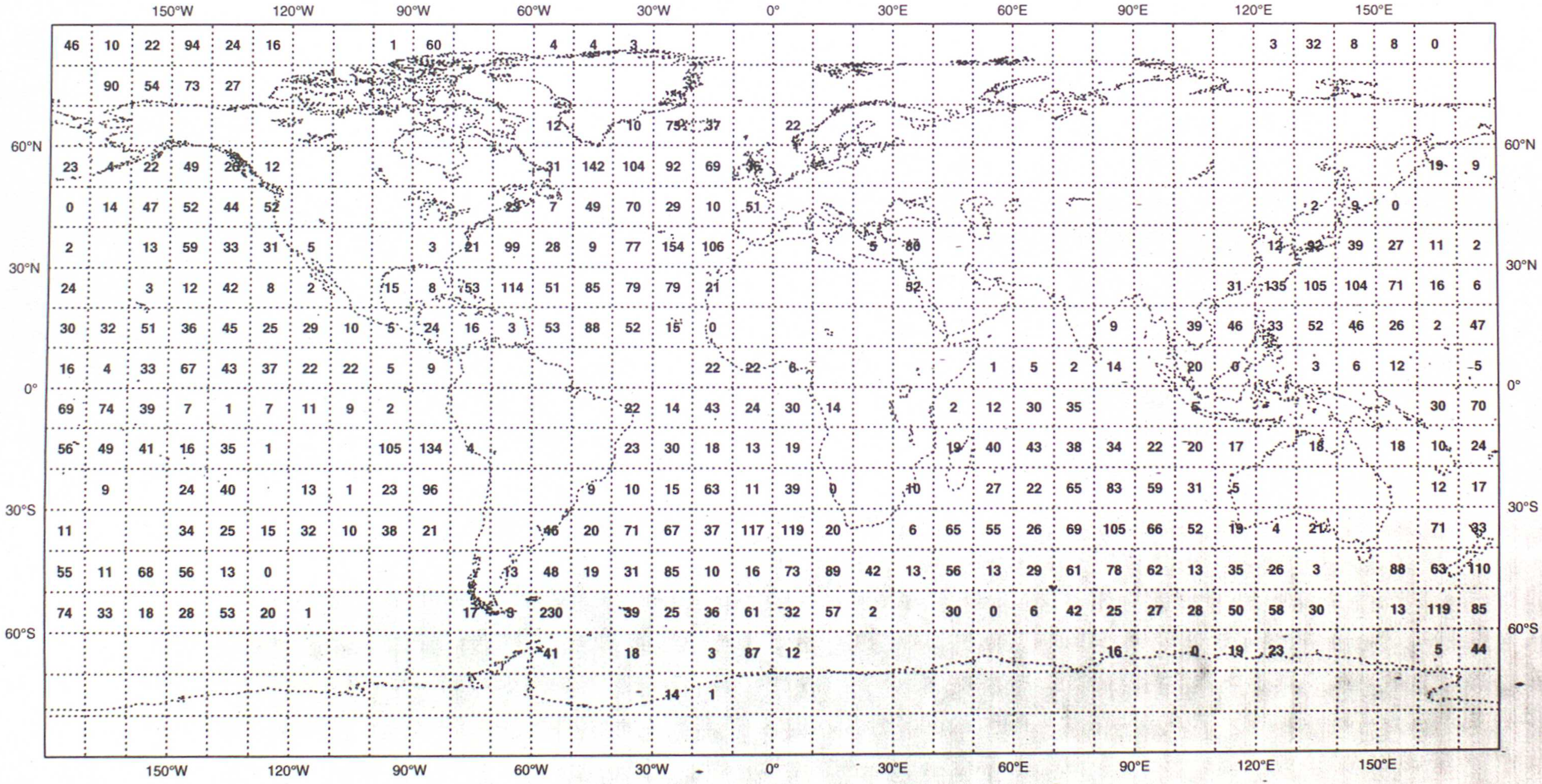

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION FEB 200

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.3W	2	MS	50	3	6	0	1.0	-9.1	9.2
60728	36.4N	10.7E	1	MS	61	0	0	0	0.6	-8.6	8.6
61492	16.1N	13.5W	18	MS	64	0	0	0	1.6	4.0	4.3
61816	10.9N	14.3W	69	MS	29	15	52	0	1.3	-2.0	2.4
62056	32.8N	21.8E	625	S8	36	1	3	0	0.9	-5.5	5.6
63330	13.5N	39.5E	2070	MS	26	26	100	100			
63333	11.1N	39.7E	1903	MS	24	0	0	58	0.5	4.4	4.4
63334	10.3N	37.7E	2515	MS	27	0	0	100	0.7	8.8	8.8
63478	5.9N	43.6E	295	MS	25	0	0	28	1.6	5.3	5.5
63801	4.9S	29.6E	882	S8	69	3	4	0	0.9	8.4	8.4
63881	8.0S	31.6E	1923	S	42	2	5	0	1.0	12.3	12.3
65355	9.8N	1.1E	342	MS	108	0	0	2	2.4	-12.0	12.2
67983	20.2S	32.6E	1131	S8	91	0	0	66	2.5	4.0	4.7
68030	18.5S	25.6E	1071	M	79	2	3	0	3.3	5.1	6.1
68106	23.6S	15.1E	407	M	20	4	20	40	4.4	-6.8	8.1
68300	26.6S	15.1E	16	M	30	13	43	0	4.3	-12.8	13.5
68372	26.9S	29.2E	1563	S8	109	0	0	0	0.6	4.8	4.8
68396	26.5S	31.3E	641	S8	51	0	0	0	0.7	5.0	5.0
68575	30.0S	30.0E	1175	S8	110	110	100	0			
68674	31.6S	29.6E	47	MS	20	0	0	0	0.8	6.9	6.9

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24329	66.3N	114.3E	236	MS	100	1	1	0	2.7	4.9	5.6
24382	66.4N	143.2E	196	MS	55	0	0	0	1.2	4.0	4.2
24671	63.9N	135.9E	402	MS	107	0	0	0	1.1	4.3	4.4
25248	67.3N	168.0E	353	MS	25	0	0	0	1.5	8.0	8.1
30554	54.5N	113.6E	995	MS	112	0	0	0	0.8	10.5	10.5
35416	49.1N	54.7E	128	S	110	0	0	0	0.9	4.3	4.4
36982	41.9N	78.2E	3635	S7	111	0	0	0	1.2	6.6	6.7
38565	40.6N	65.7E	485	MS	109	109	100	0			
38846	38.4N	70.0E	1437	S8	37	0	0	0	1.1	-6.5	6.6
40435	24.5N	44.4E	991	MS	53	0	0	2	1.6	7.4	7.6
40700	39.6N	47.9E	45	MS	110	2	2	1	1.2	-6.5	6.6
40713	37.4N	46.3E	1475	MS	110	46	42	1	0.7	13.6	13.6
40741	36.5N	61.2E	235	MS	110	1	1	0	1.0	-4.7	4.8
40743	36.2N	57.7E	978	MS	111	0	0	45	1.2	4.2	4.4
40757	35.6N	53.4E	1171	MS	111	0	0	2	1.3	5.0	5.2
40780	33.6N	46.4E	1362	MS	109	1	1	0	0.8	4.6	4.7
41254	23.1N	57.6E	1755	S8	87	87	100	0			
44265	46.1N	91.5E	1186	MS	111	2	2	2	2.0	4.8	5.2
44416	28.6N	81.6E	720	MS	74	2	3	1	1.9	4.0	4.4
47022	40.8N	128.2E	1224	S	76	0	0	3	1.1	4.2	4.3
47678	33.1N	139.8E	79	MS	113	0	0	0	0.7	-9.5	9.5
48924	21.1N	101.5E	644	S	49	0	0	0	1.2	11.0	11.1
48925	20.7N	102.0E	550	S	51	0	0	2	1.2	-10.5	10.6
48938	19.2N	101.7E	326	MS	44	24	55	0	1.7	13.8	13.9
48952	15.7N	106.4E	168	MS	44	0	0	0	1.1	-4.1	4.2
50727	47.2N	119.9E	1028	MS	112	0	0	0	0.7	5.2	5.2
50978	45.3N	131.0E	234	MS	112	0	0	54	0.7	-5.8	5.8
51288	45.4N	90.5E	1651	S	112	0	0	1	1.6	-4.7	5.0
51334	44.6N	82.9E	321	M	106	0	0	0	2.8	5.4	6.1
51379	44.0N	89.6E	794	M	108	0	0	0	2.2	6.4	6.8
51495	43.2N	91.7E	874	M	107	0	0	4	3.3	7.5	8.2
52866	36.6N	101.8E	2262	S	112	0	0	0	1.1	-4.5	4.6
53646	38.2N	109.7E	1058	MS	112	0	0	54	0.9	-11.5	11.5
56287	30.0N	103.0E	629	M	111	0	0	6	2.1	4.3	4.8
56462	29.0N	101.5E	2994	S	113	0	0	0	1.6	8.8	8.9

56768	25.0N	101.5E	1773	S	111	0	0	0	0.9	-5.3	5.4
57816	26.6N	106.7E	1074	MS	112	96	86	0	0.3	-14.6	14.6
59663	21.9N	112.0E	22	MS	111	0	0	54	0.8	-7.5	7.5

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80434	9.2N	66.0W	125	MS	90	2	2	1	1.3	-5.1	5.3
82181	2.0S	54.1W	146	MS	76	0	0	0	1.0	5.3	5.4
82704	7.6S	72.7W	170	S	48	0	0	0	1.2	-4.7	4.9
83235	12.4S	46.4W	604	MS	84	0	0	0	0.8	6.5	6.5
83332	14.1S	46.4W	826	MS	83	7	8	0	0.7	13.7	13.7
83470	17.9S	50.9W	727	MS	81	0	0	0	0.7	-5.7	5.7
83531	18.6S	46.5W	940	MS	84	0	0	0	0.6	-6.2	6.2
83738	22.5S	44.5W	440	MS	80	1	1	0	0.8	-13.2	13.2
83836	25.5S	50.6W	837	MS	84	1	1	1	0.7	-5.2	5.2
84425	5.9S	76.1W	179	MS	24	0	0	0	1.2	4.0	4.2
84455	6.5S	76.4W	281	MS	82	1	1	2	1.3	7.7	7.8
84472	7.1S	78.5W	2620	S	53	0	0	2	1.2	-5.7	5.8
84474	7.2S	76.7W	350	S	22	0	0	0	0.9	9.2	9.2
84686	13.6S	72.0W	3248	S	110	0	0	0	0.7	-4.2	4.3
84688	13.7S	73.4W	3444	S	47	1	2	0	0.5	-12.2	12.2
84782	18.1S	70.3W	468	MS	93	0	0	5	1.3	6.3	6.4
85140	14.3S	67.4W	140	MS	53	1	2	0	1.2	6.6	6.7
85312	19.8S	63.9W	992	S	40	0	0	0	1.1	-9.9	10.0
85432	22.5S	68.9W	2320	S8	80	0	0	0	0.5	4.6	4.6

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71048	61.6N	125.8W	610	S	46	0	0	0	1.5	7.2	7.4
71049	66.0N	91.8W	150	MS	106	85	80	0	1.0	2.9	3.1
71060	52.5N	116.1W	230	MS	108	108	100	0			
71094	66.6N	61.6W	393	MS	111	0	0	0	1.5	-5.2	5.4
71181	47.1N	55.3W	29	MS	112	0	0	0	0.9	-6.2	6.3
71408	47.4N	55.8W	35	MS	101	0	0	15	1.7	-5.3	5.6
71421	51.9N	63.3W	589	S	103	0	0	0	0.9	4.4	4.5
71475	49.3N	124.8W	2	MS	112	0	0	24	3.6	-5.6	6.7
71506	67.0N	136.2W	720	MS	113	0	0	0	1.5	-6.6	6.8
71619	48.0N	65.3W	46	MS	260	136	52	0	4.1	-1.2	4.3
76055	31.0N	114.9W	440	MS	64	64	100	0			
76225	28.6N	106.1W	1435	MS	90	0	0	1	1.3	-4.1	4.3
76543	22.0N	98.8W	104	S	26	0	0	0	1.5	8.1	8.2
76658	19.2N	103.7W	494	MS	24	1	4	4	0.7	5.7	5.7
76762	17.5N	99.5W	1265	MS	73	0	0	0	1.1	5.3	5.4
76903	14.9N	92.3W	118	MS	78	0	0	1	1.4	5.3	5.5
78588	17.2N	87.5W	25	M	112	107	96	0	0.4	-0.2	0.4
78655	14.0N	89.6W	725	MS	31	0	0	55	2.3	10.2	10.5

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	26	1	4	4	1.6	10.0	10.1
94130	14.8S	131.9E	120	MS	113	0	0	0	1.0	5.4	5.5
96505	3.7N	115.7E	-9999	8	34	34	100	0			
97378	10.7S	123.1E	1	MS	29	26	90	0	0.8	-14.0	14.0
98851	6.1N	125.2E	14	S	84	6	7	100	0.6	-13.6	13.6

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS

01360	61.9N	7.9E	711	MS	113	0	0	0	1.1	6.9	7.0
06605	47.1N	7.1E	1599	S8	112	0	0	0	1.3	-4.6	4.8
06685	47.0N	9.1E	515	MS	112	0	0	7	1.5	7.5	7.6
08912	42.9N	0.8W	1434	MS	212	212	100	0			
08922	42.8N	0.2W	1660	MS	139	139	100	0			
10850	48.8N	10.7E	457	MS	339	0	0	0	0.5	-5.6	5.6
11116	47.5N	10.8E	870	MS	56	1	2	0	0.8	5.0	5.1
13269	44.3N	19.9E	176	MS	106	1	1	1	0.8	8.0	8.0
14554	44.9N	18.4E	136	S	45	5	11	0	0.8	-13.6	13.6
16538	40.1N	9.3E	1022	S	37	0	0	3	1.1	8.5	8.6
17203	38.9N	40.5E	1177	S8	113	0	0	0	1.2	7.0	7.1
17310	36.6N	32.0E	6	MS	79	58	73	0	0.8	-0.1	0.8
37018	44.1N	39.0E	95	MS	108	0	0	0	0.9	6.6	6.7

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	89	0	0	0	1.2	-5.5	5.6
89263	66.0S	66.1W	20	M	234	5	2	0	1.0	12.4	12.4
89264	71.4S	68.9W	780	S	137	0	0	0	1.0	8.7	8.8
89266	72.2S	60.2W	91	S	250	211	84	0	3.8	-12.9	13.4
89272	75.0S	70.8W	1395	S	244	244	100	0			
89610	65.9S	113.1E	90	S	216	0	0	0	1.2	-8.5	8.6
89614	66.6S	111.2E	500	S	237	237	100	0			
89661	73.1S	169.6E	200	S	21	2	10	0	1.8	7.8	8.0
89744	74.0S	43.1E	3353	S	265	0	0	0	0.5	6.9	6.9
89811	66.7S	112.8E	1366	M	226	0	0	0	1.0	-4.0	4.1

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	2633	0	26	1.7	0.0	2613	0	26	0	8.4	0.8
AAL	4616	1	24	1.6	0.1	4455	0	25	0	8.0	0.7
AAR	1371	0	5	1.9	-0.5	1356	1	7	0	8.1	0.2
ACA	2288	0	10	1.7	-0.2	2232	0	10	0	8.1	0.3
ACI	102	0	7	1.0	0.7	102	0	7	0	6.8	2.2
AEA	787	1	2	1.6	-0.1	463	0	4	0	8.2	0.3
AEL	633	1	7	1.6	-0.2	524	0	7	0	8.3	0.7
AEW	75	1	4	1.2	-0.5	75	0	1	0	6.3	1.5
AFL	453	0	3	1.7	0.6	402	0	4	0	7.6	0.8
AFR	1501	1	8	1.8	0.3	1194	0	8	0	7.8	0.4
AJM	325	0	2	1.5	-0.3	297	0	2	0	7.0	0.6
AJX	311	0	4	1.5	0.6	311	2	6	0	7.6	-0.1
AMT	1317	0	28	1.3	0.0	1317	0	29	0	7.7	0.7
AMX	304	1	5	1.9	0.4	237	1	55	0	10.7	0.2
ANA	103	2	16	1.9	0.5	105	0	15	0	10.5	0.2
ANZ	4846	0	23	1.3	0.4	4846	0	23	0	6.8	0.8
ARG	33	0	30	2.0	0.7	31	0	26	0	6.2	1.2
ATN	142	1	100	4.0	-2.1	138	0	18	0	10.2	1.4
AVA	238	1	5	1.5	0.3	168	1	4	0	6.8	0.5
AVN	144	0	47	1.0	0.1	144	0	47	0	5.8	0.3
AZA	413	1	6	1.8	-0.1	356	0	5	0	8.5	1.0
BAL	308	0	6	1.5	0.3	267	0	9	0	7.7	1.1
BAW	884	1	14	1.7	-0.3	829	0	14	0	8.4	0.4
BBR	151	1	7	1.8	0.5	97	0	11	0	12.0	0.2
BHP	42	0	0	1.2	-0.6	40	0	0	0	5.3	1.4
BMI	40	0	18	1.6	0.1	41	0	20	0	8.7	0.3
BPA	510	1	62	1.8	-0.1	436	0	6	0	8.7	0.1
BSK	46	2	2	1.4	-0.2	49	0	14	0	12.0	0.4
BWA	363	1	5	1.6	-0.3	274	0	4	0	7.0	0.3
CAL	39	0	5	1.8	0.2	37	0	5	0	7.2	1.3
CCA	244	2	18	2.4	0.0	253	3	100	0	14.5	-0.9
CES	264	3	13	2.3	0.0	264	2	9	0	9.5	0.3
CFC	49	0	10	1.6	-0.1	52	0	12	0	9.5	1.7
CFG	1076	1	3	1.4	-0.2	946	0	3	0	7.1	0.4
CKK	217	1	5	1.8	0.1	223	0	5	0	8.4	0.7
CKS	337	1	23	2.0	1.1	337	1	23	0	8.2	1.1
CLX	379	0	4	1.6	-0.7	296	0	4	0	6.7	0.0
COA	206	2	23	1.4	0.0	167	0	20	0	7.0	1.3
CRL	994	1	4	1.6	0.5	744	0	5	0	8.3	0.9
CSN	89	0	3	2.2	0.2	92	2	9	0	12.2	-0.4
CUB	197	1	4	1.9	-0.4	173	0	6	0	9.8	0.4
DAL	2103	0	27	1.5	0.0	2063	0	28	0	7.4	0.6
DCS	35	3	3	1.2	-0.4	35	0	0	0	5.3	2.0
DHL	121	0	100	6.3	-5.9	120	0	100	0	12.4	1.0
DLH	893	0	12	1.5	-0.1	850	1	13	0	6.7	0.6
EDW	97	0	1	1.5	-0.3	91	1	5	0	8.7	0.8
EEZ	132	0	2	1.5	0.1	113	0	4	0	7.4	0.9
EIA	333	3	100	2.9	1.0	322	0	100	0	18.5	6.5
ELY	167	1	4	1.5	-0.1	172	0	7	0	8.6	1.1
EVA	107	0	11	2.0	0.0	116	0	9	0	9.1	-0.7
FCA	127	0	2	1.7	0.7	106	1	6	0	9.5	0.4
FDX	1612	0	36	1.5	0.3	1607	0	36	0	8.2	0.4
FIN	218	0	5	1.7	0.1	212	0	6	0	6.3	0.5
FJI	725	3	34	1.5	0.7	722	0	33	0	6.2	1.0
FOM	684	0	27	1.4	0.4	682	0	27	0	6.8	0.2
FWI	462	1	4	1.9	-0.2	434	0	4	0	8.5	0.6
GAF	53	0	2	1.9	-1.0	54	2	2	0	6.5	1.1
GCO	179	1	9	1.5	0.4	180	1	13	0	11.1	1.4
GHA	54	0	2	1.5	-0.1	43	0	12	0	17.6	1.8

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GRL	70	0	10	2.5	1.0	66	0	0	0	5.4	1.4
GTI	219	1	11	1.6	0.3	217	0	11	0	8.1	1.4
HAL	3132	0	25	1.5	0.0	3113	0	26	0	8.1	0.5
HLN	195	1	16	1.7	0.4	173	1	16	0	7.7	0.6
HRH	84	0	46	1.5	0.5	84	0	46	0	6.3	1.4
HXL	32	0	25	2.0	-0.6	32	0	19	0	6.9	1.8
IBE	2817	1	4	1.6	0.3	1905	0	6	0	8.0	0.7
ICE	802	1	7	1.7	-0.1	779	1	6	0	8.8	0.8
IRL	24	0	0	2.1	1.7	24	0	0	0	4.8	0.5
IWD	188	1	3	1.6	0.0	135	1	5	0	7.0	0.3
JAL	2809	0	4	1.7	0.4	2793	0	5	0	7.8	0.1
JAZ	640	0	4	1.4	0.7	642	0	5	0	7.1	0.1
JBU	52	0	0	0.9	0.0	52	0	2	0	9.1	-0.3
KAI	22	0	23	1.6	0.5	20	0	35	0	8.0	-1.2
KAL	1937	1	10	1.9	-0.1	1921	0	10	0	8.7	-0.1
KLM	1394	1	5	1.7	0.0	1225	0	6	0	8.0	0.6
LAN	508	0	4	1.5	0.1	507	0	5	0	6.3	0.7
LAP	77	0	45	2.4	1.1	76	0	43	0	7.4	-0.5
LDA	71	6	49	5.0	3.5	64	0	9	0	10.2	0.3
LDI	523	0	2	1.5	0.0	406	0	4	0	8.1	0.4
LNE	79	1	4	1.3	-0.3	54	0	6	0	13.7	0.0
LOT	112	0	4	2.0	-1.3	109	0	3	0	7.8	0.0
LTU	920	1	6	1.6	-0.1	794	0	6	0	7.4	0.9
MAS	159	2	11	2.4	0.7	157	2	5	0	8.0	-0.3
MON	98	0	13	3.2	1.1	91	1	4	0	8.1	1.7
MPD	244	1	4	1.8	0.3	183	2	3	0	7.8	0.5
MPH	684	0	4	1.8	-0.8	622	0	5	0	8.7	0.2
MXA	78	4	27	3.6	0.5	77	1	31	0	20.6	0.9
MYT	281	1	5	2.1	0.7	249	1	4	0	6.9	1.0
NAO	401	0	16	1.8	-0.2	397	0	19	0	9.6	0.5
NCA	1064	0	3	1.6	0.1	775	0	6	0	7.6	0.3
NWA	6793	1	8	1.8	0.1	6764	0	9	0	7.9	0.4
NZL	2117	0	20	1.4	0.1	2124	0	20	0	6.9	0.6
OAE	463	1	23	1.4	-0.2	458	0	65	0	12.5	2.6
PAC	428	0	10	1.7	-0.2	427	1	10	0	7.0	0.4
PAL	1245	1	8	1.5	0.2	1200	1	12	0	10.2	0.2
PAO	273	0	50	1.1	0.3	272	0	50	0	6.2	-0.2
PBI	132	0	38	1.4	0.3	131	0	37	0	6.1	-0.3
PHA	50	0	4	1.5	0.3	45	0	9	0	8.0	0.6
PLM	170	0	8	2.0	0.8	93	0	51	0	11.9	-0.6
QFA	3746	0	40	1.3	0.5	3732	0	41	0	6.7	0.7
QQA	50	0	50	1.0	0.4	51	0	49	0	6.1	0.2
RAM	256	1	6	2.2	0.2	164	0	47	0	10.3	1.4
RCH	408	1	100	3.4	-0.5	346	0	100	0	11.8	1.4
RRR	51	22	33	2.2	0.3	47	0	13	0	8.4	0.5
RZO	350	0	5	1.9	-0.3	200	0	7	0	9.2	0.6
SAA	130	1	2	1.6	-0.6	109	0	5	0	9.6	0.8
SEU	665	1	4	1.7	0.1	602	0	4	0	8.1	0.8
SHE	31	0	6	2.3	1.4	31	0	10	0	9.8	1.2
SIA	369	0	1	1.4	0.3	371	0	1	0	6.5	0.8
SQC	47	0	4	1.7	0.4	47	0	4	0	8.5	0.4
SSV	33	3	12	1.9	0.1	32	0	3	0	6.4	-0.8
TAG	39	3	13	2.2	-0.1	41	0	12	0	6.7	0.4
TAM	28	0	21	1.4	0.0	28	0	21	0	8.8	3.4
TAP	521	1	4	1.6	-0.4	227	0	5	0	8.3	0.3
TCX	38	0	5	1.5	0.7	36	0	6	0	4.8	1.3
THA	162	1	4	1.8	0.4	163	1	1	0	6.7	-0.3
THT	126	0	25	1.1	0.1	121	1	27	0	8.0	0.8
TPA	38	0	3	1.3	0.2	34	0	0	0	7.1	-0.8

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TSC	26	0	0	1.3	-0.5	27	0	0	0	6.0	0.1
UAE	498	0	5	1.3	0.4	498	0	5	0	5.5	0.1
UAL	79053	0	90	1.3	-0.3	79272	0	90	0	5.6	0.7
UPS	1747	1	50	1.5	0.1	1709	0	50	0	7.5	0.6
USA	170	1	3	1.3	0.0	149	0	3	0	7.2	0.5
VIR	113	0	3	1.8	0.0	107	0	5	0	7.4	0.4
VRG	117	4	34	2.5	1.2	117	0	100	0	11.9	-0.2
VVJ	47	2	6	1.2	0.0	43	2	7	0	5.9	1.2
VVR	45	0	16	2.0	0.8	44	0	25	0	7.6	1.0
WOA	502	2	10	1.6	0.2	491	0	12	0	8.4	1.2
XLA	184	1	4	1.2	0.4	155	1	5	0	8.4	0.9
YSS	46	0	2	2.2	0.6	36	0	3	0	9.1	0.3

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	34233	0	10	1.2	0.6	34251	0	10	0	5.5	0.6
EU	158436	0	23	1.3	0.2	158436	0	22	0	4.8	0.6
KL	1749	0	1	1.3	0.3	1749	0	1	0	6.2	0.5
MK	3128	0	6	1.6	1.1	3106	0	6	0	6.8	1.5
SA	3397	0	38	1.7	1.2	3353	0	16	0	6.1	0.3
TN	66	0	21	2.7	0.9	70	0	20	0	8.2	1.0

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	1000	3	22	2.3	0.2	1014	0	18	0	7.7	1.0
US ACARS	848892	0	62	1.4	0.2	848882	0	62	0	5.6	0.8

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

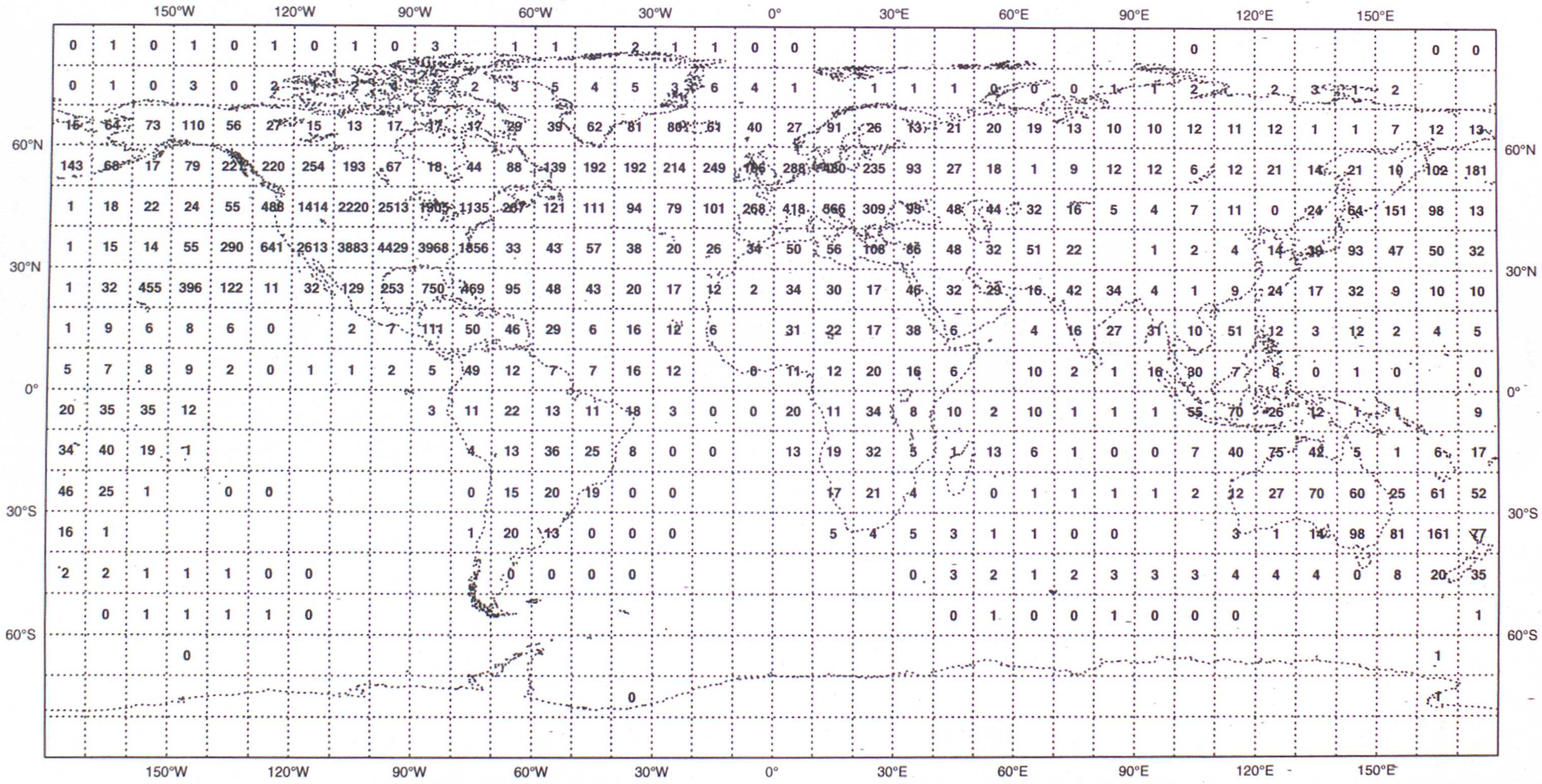
NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	404	0	35	1.4	-0.1	401	0	34	0	5.5	0.7
ACA	29	0	21	1.3	0.7	29	0	21	0	6.0	-0.8
AFL	26	0	15	3.0	1.3	25	0	12	0	11.3	1.5
AFR	102	1	5	1.6	0.0	98	0	3	0	6.5	1.1
AMT	30	0	3	1.6	-0.1	30	0	3	0	7.8	-0.8
ANZ	168	3	21	1.5	0.1	173	0	19	0	6.1	0.1
CFC	69	3	7	1.4	0.8	70	1	9	0	9.2	1.1
CFG	32	0	9	1.3	0.1	26	0	8	0	6.1	-0.4
CKS	60	0	15	2.0	0.2	59	0	12	0	9.4	0.8
CRL	41	0	5	1.2	0.3	35	0	9	0	8.5	-0.5
DAL	213	0	31	1.6	-0.1	216	0	30	0	7.8	0.5
DLH	341	1	17	1.3	0.1	339	0	17	0	6.8	0.9
EIA	50	0	100	3.9	3.0	46	0	100	0	19.5	-0.8
FDX	658	1	27	1.3	0.3	671	0	27	0	7.8	0.5
FIN	28	0	4	0.9	0.6	27	0	4	0	7.9	-0.2
GCO	124	0	3	1.4	0.3	124	0	18	0	12.3	1.1
HAL	467	0	28	1.6	-0.3	463	0	28	0	7.5	0.7
IBE	46	0	7	1.3	0.2	45	0	9	0	6.2	-0.3
ICE	28	0	0	1.4	-0.8	27	0	0	0	8.1	0.1
JAL	124	2	10	1.8	0.5	124	0	8	0	8.2	0.0
JAZ	54	0	6	1.6	0.7	53	0	8	0	6.3	1.1
JKK	25	0	44	0.9	0.5	26	0	42	0	3.8	0.9
KAL	44	2	7	1.7	-0.8	43	0	7	0	9.5	0.6
KIW	27	11	41	2.4	1.1	26	0	38	0	6.4	1.8
KLM	53	0	4	1.3	0.7	52	0	6	0	6.6	0.2
LAN	35	0	11	1.2	0.4	35	0	11	0	7.0	-0.2
MPH	156	0	2	1.3	0.1	151	1	5	0	7.2	1.8
MYT	29	3	7	3.1	2.3	25	4	8	0	6.9	1.0
NCA	61	0	0	1.4	-0.2	51	0	4	0	8.6	0.6
NWA	443	0	9	1.5	0.4	442	0	12	0	8.8	0.2
NZL	21517	0	59	1.3	0.0	21564	0	59	0	5.9	-0.1
OAE	87	0	21	1.5	-0.1	77	0	62	0	14.4	1.4
PAL	67	0	27	1.5	-0.6	66	0	30	0	10.7	0.3
QFA	234	2	42	1.9	0.2	234	0	39	0	6.9	1.2
RCH	42	0	100	4.1	0.4	42	0	100	0	11.2	1.0
RRR	85	21	36	3.3	1.5	79	0	11	0	10.3	0.3
SIA	48	0	8	1.6	0.5	48	0	6	0	5.5	1.7
SKI	59	7	53	4.3	-1.4	61	8	57	0	24.8	1.1
UAE	71	0	0	1.3	0.7	72	0	3	0	7.9	0.7
UAL	130915	0	99	1.1	-0.1	130803	0	99	0	4.4	0.2
UPS	174	0	47	1.4	-0.4	162	0	47	0	9.7	0.8
VVP	32	3	41	2.4	1.5	30	0	40	0	8.4	0.3
WOA	172	0	5	1.0	0.2	171	0	5	0	6.5	-0.1

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	24683	0	50	1.4	0.2	24684	0	50	0	4.5	0.0
EU	572490	0	68	1.1	0.2	572382	0	68	0	4.0	-0.1
KL	1077	0	57	1.5	-0.3	1077	0	57	0	4.9	0.0
MK	1923	0	52	1.8	0.8	1909	0	52	0	4.7	0.8
SA	2384	0	67	1.6	0.5	2377	0	62	0	4.6	0.4

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
US ACARS	1567742	0	77	1.2	0.3	1563790	0	77	0	4.5	0.3

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. FEBRUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 43021


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
0 1 0 1 0 1 0 1 0 3 1 1 2 1 1 0 0 0 0 0
0 1 0 3 0 2 1 2 4 2 3 5 4 5 3 6 4 1 1 1 1 0 0 1 1 2 2 3 1 2
16 64 73 110 56 27 15 13 17 17 17 29 39 62 81 80 61 40 27 91 26 13 21 20 19 13 10 10 12 11 12 1 1 7 12 13
143 68 17 79 22 220 254 193 67 18 44 88 139 192 192 214 249 186 288 480 235 93 27 18 1 9 12 12 6 12 21 14 21 10 102 181
1 18 22 24 55 488 1414 2220 2513 1905 1135 267 121 111 94 79 101 268 418 866 309 98 48 44 32 16 5 4 7 11 0 24 64 151 98 13
1 15 14 55 290 641 2613 3883 4429 3968 1856 33 43 57 38 20 26 34 50 56 108 86 48 32 51 22 1 2 4 14 39 93 47 50 32
1 32 455 396 122 11 32 129 253 750 469 95 48 43 20 17 12 2 34 30 17 46 32 29 16 42 34 4 1 9 24 17 32 9 10 10
1 9 6 8 6 0 2 7 111 50 46 29 6 16 12 6 31 22 17 38 6 4 16 27 31 10 51 12 3 12 2 4 5
5 7 8 9 2 0 1 1 2 5 49 12 7 7 16 12 6 11 12 20 16 6 10 2 1 16 80 7 8 0 1 0 0
20 35 35 12 3 11 22 13 11 48 3 0 0 20 11 34 8 10 2 10 1 1 1 55 70 26 12 1 1 9
34 40 19 1 4 13 36 25 8 0 0 13 19 32 5 1 13 6 1 0 0 7 40 75 42 5 1 6 17
46 25 1 0 0 0 15 20 19 0 0 17 21 4 0 1 1 1 1 2 12 27 70 60 25 61 52
16 1 1 20 13 0 0 0 5 4 5 3 1 1 0 0 3 1 14 98 81 161 77
2 2 1 1 1 0 0 0 0 0 0 0 3 2 1 2 3 3 3 4 4 4 0 8 20 35
0 1 1 1 1 0 0 1 0 0 1 0 0 0 1
0 1
0 1

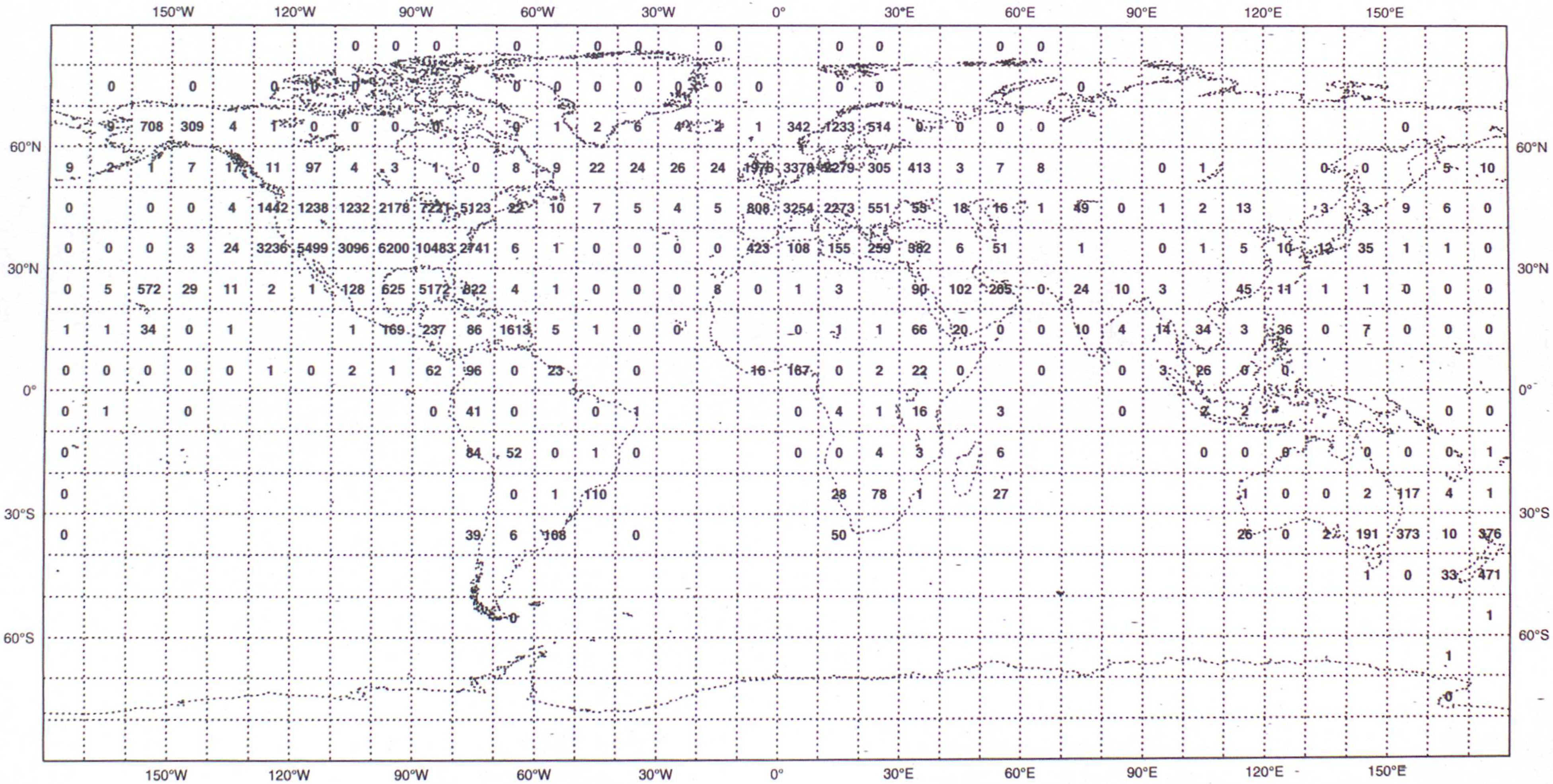

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9 708 309 4 1 0 0 0 0 0 1 2 6 4 2 1 342 1233 514 0 0 0 0 0
9 2 1 7 17 11 97 4 3 1 0 8 9 22 24 26 24 1978 3378 4279 305 413 3 7 8 0 1 0 0 5 10
0 0 0 4 1442 1238 1232 2178 7221 5123 22 10 7 5 4 5 808 3254 2273 551 55 18 16 1 49 0 1 2 13 3 3 9 6 0
0 0 0 3 24 3236 5499 3096 6200 10483 2741 6 1 0 0 0 0 423 108 155 259 382 6 51 1 0 1 5 10 12 35 1 1 0
0 5 572 29 11 2 1 128 625 5172 822 4 1 0 0 0 8 0 1 3 90 102 205 0 24 10 3 45 11 1 1 0 0 0
1 1 34 0 1 1 169 237 86 1613 5 1 0 0 0 1 1 66 20 0 0 10 4 14 34 3 36 0 7 0 0 0
0 0 0 0 0 1 0 2 1 62 96 0 23 0 16 167 0 2 22 0 0 0 3 26 0 0
0 1 0 0 41 0 0 1 0 4 1 16 3 0 2 2 0 0
0 84 52 0 1 0 0 0 4 3 6 0 0 0 0 0 0 1
0 0 1 110 28 78 1 27 1 0 0 2 117 4 1
0 39 6 168 0 50 26 0 2 191 373 10 376
1 0 33 471
1
1
0

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. FEBRUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 82998

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. FEBRUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

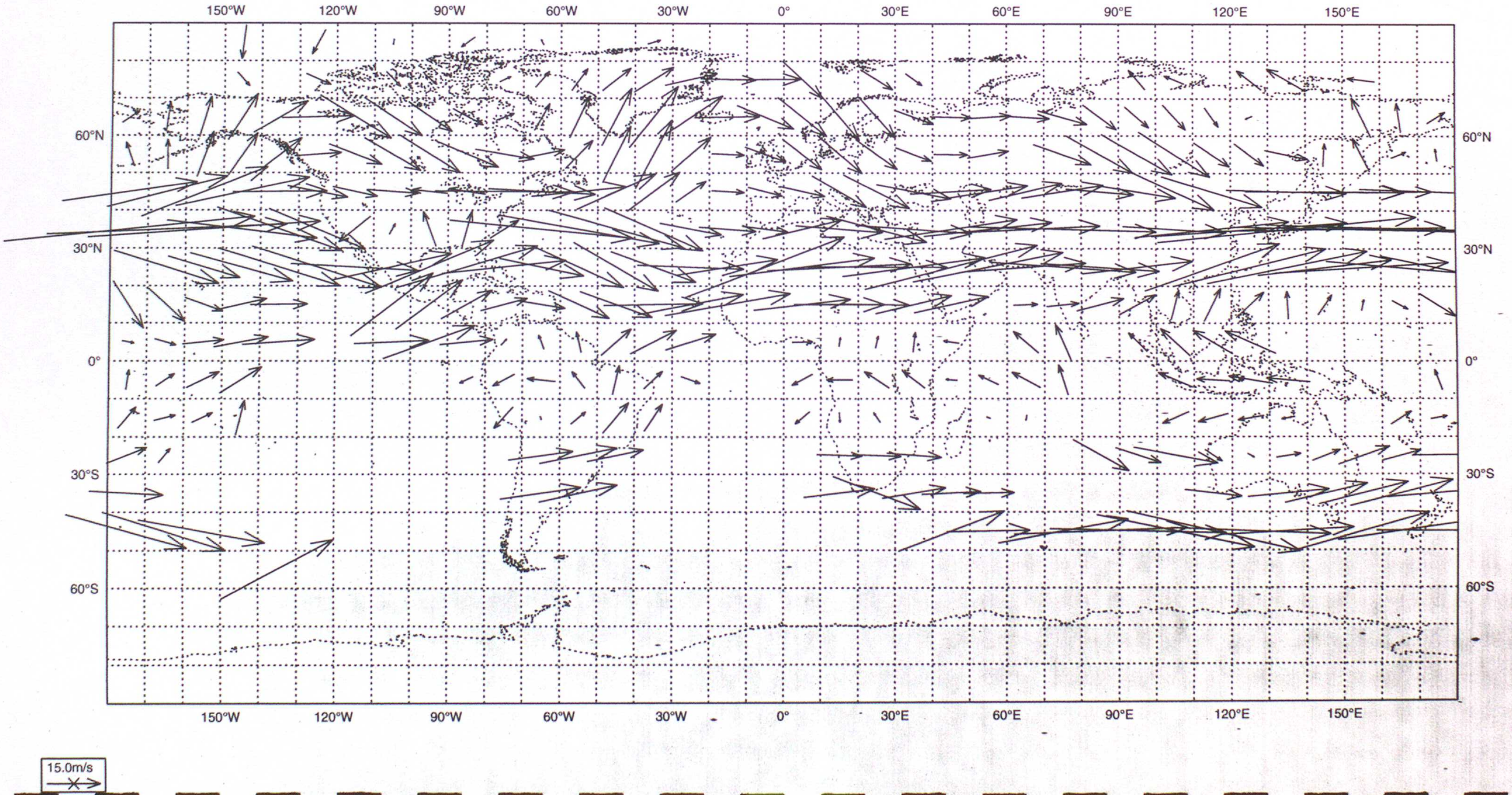

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. FEBRUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

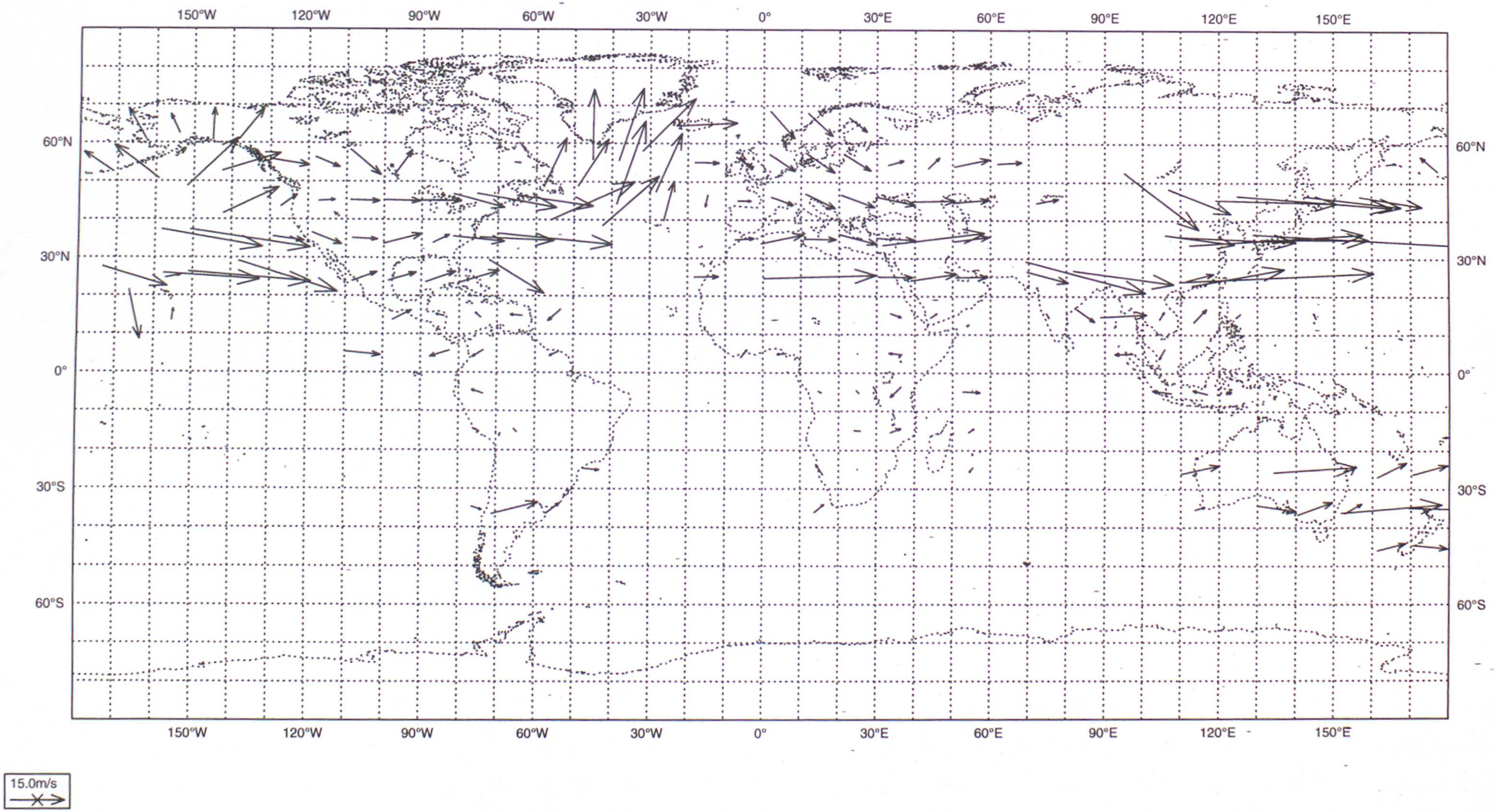
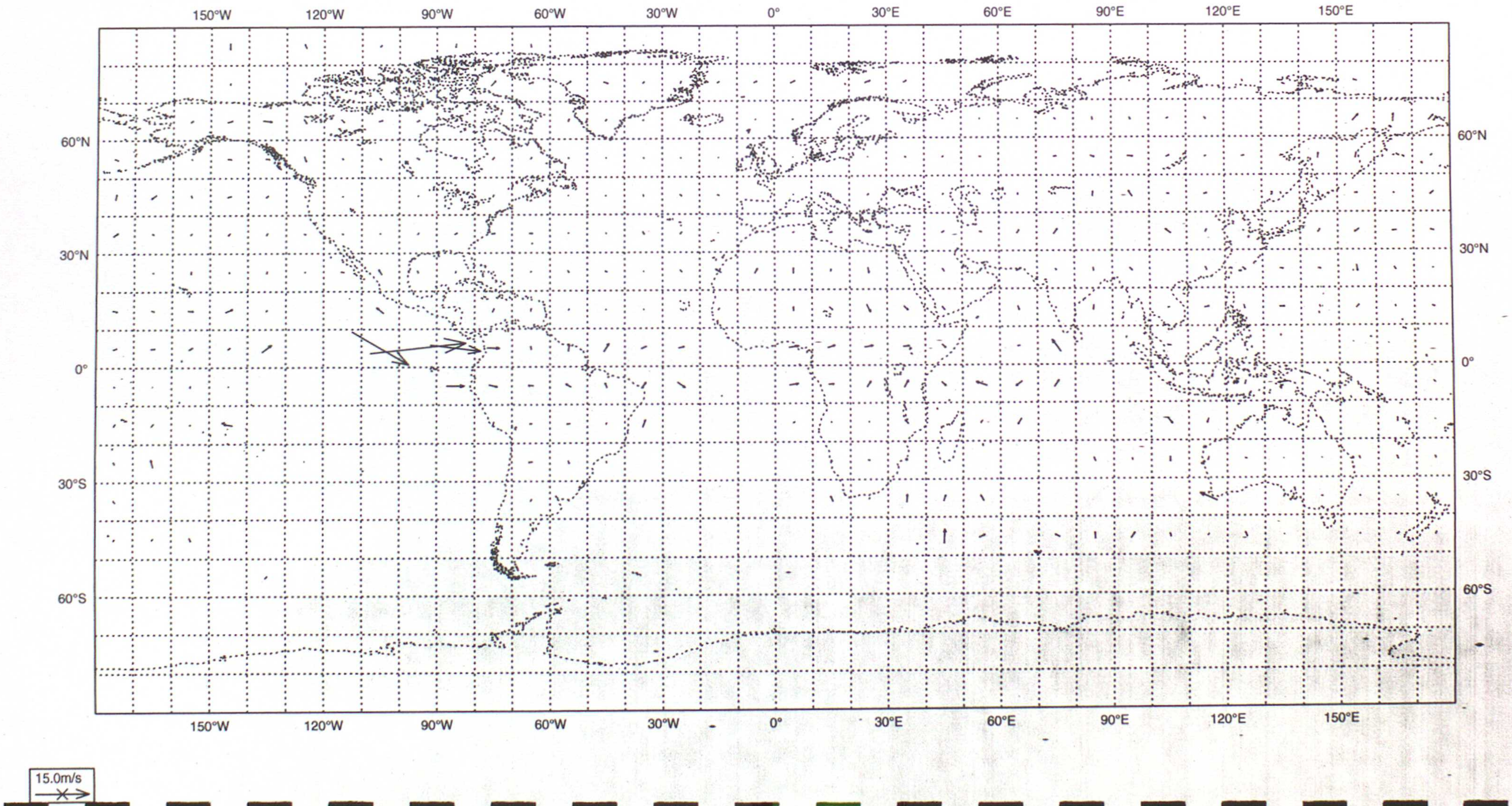

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. FEBRUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present



150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. FEBRUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

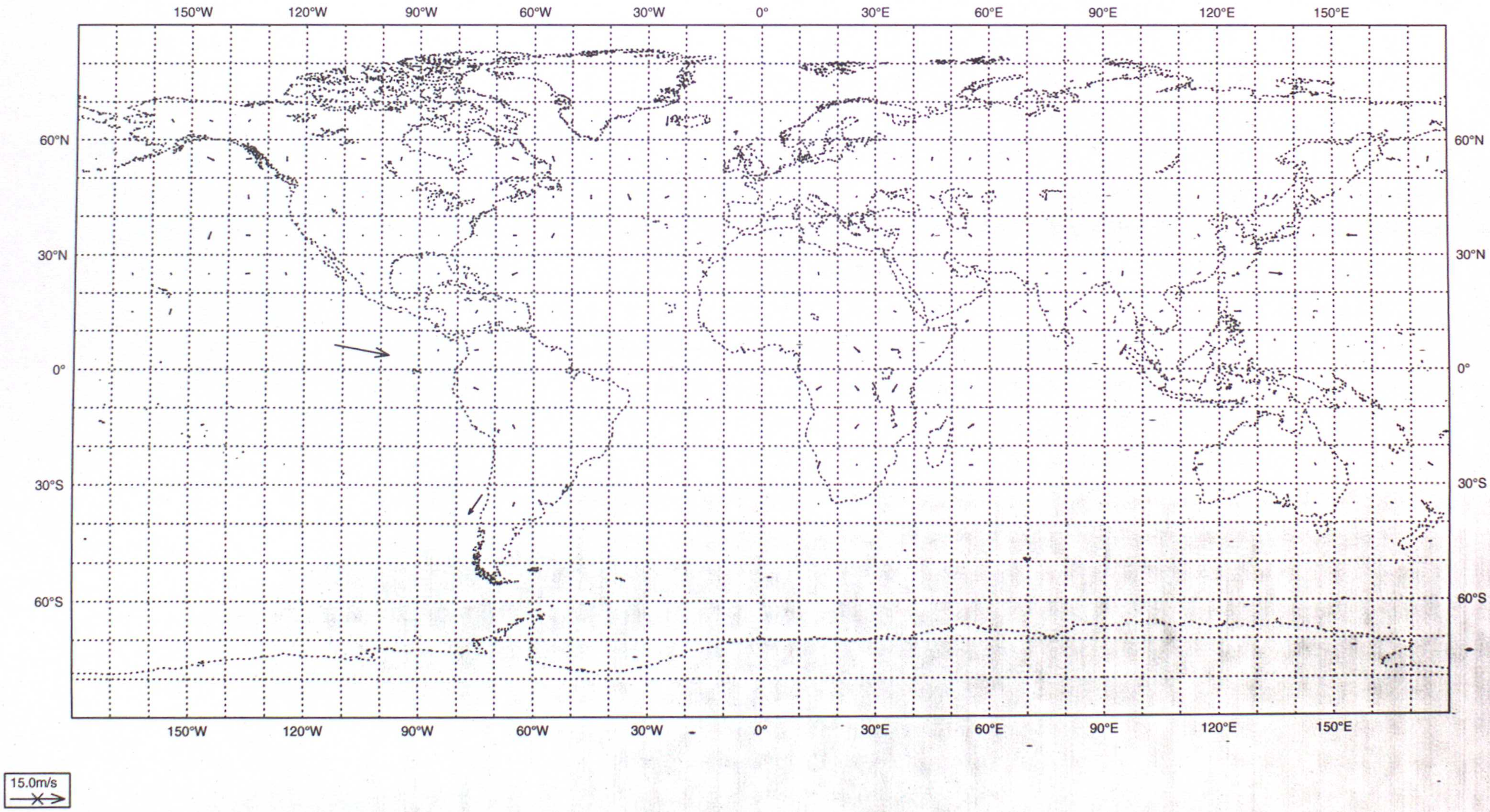

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). FEBRUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

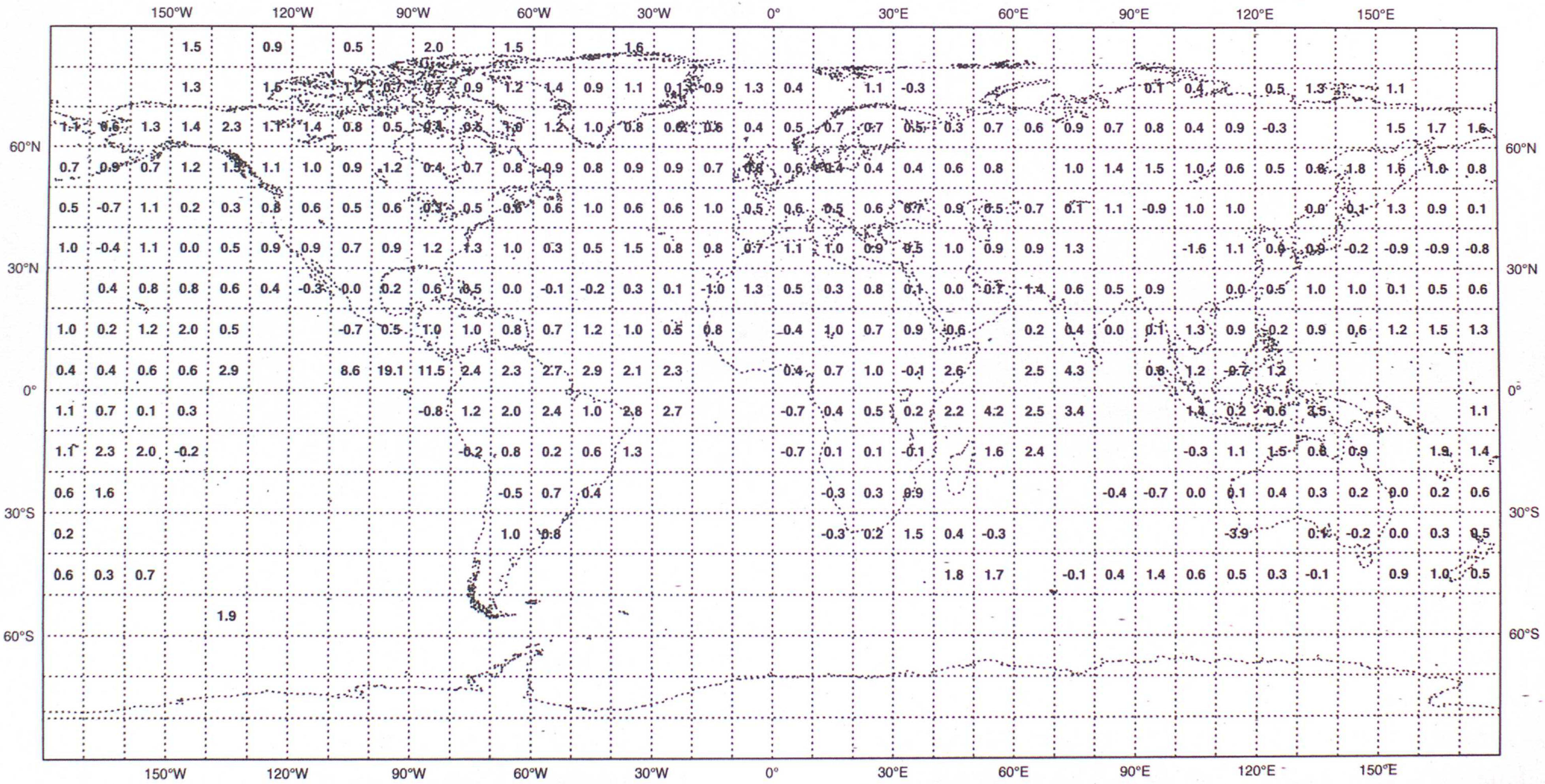

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1.5 0.9 0.5 2.0 1.5 1.6
1.3 1.5 1.2 0.7 0.7 0.9 1.2 1.4 0.9 1.1 0.1 -0.9 1.3 0.4 1.1 -0.3 0.1 0.4 0.5 1.3 1.1
1.1 0.6 1.3 1.4 2.3 1.1 1.4 0.8 0.5 0.4 0.5 1.0 1.2 1.0 0.8 0.6 0.6 0.4 0.5 0.7 0.7 0.5 0.3 0.7 0.6 0.9 0.7 0.8 0.4 0.9 -0.3 1.5 1.7 1.6
0.7 0.9 0.7 1.2 1.5 1.1 1.0 0.9 1.2 0.4 0.7 0.8 0.9 0.8 0.9 0.9 0.7 0.8 0.6 0.4 0.4 0.4 0.6 0.8 1.0 1.4 1.5 1.0 0.6 0.5 0.8 1.8 1.6 1.0 0.8
0.5 -0.7 1.1 0.2 0.3 0.8 0.6 0.5 0.6 0.3 0.5 0.6 0.6 1.0 0.6 0.6 1.0 0.5 0.6 0.5 0.6 0.7 0.9 0.5 0.7 0.1 1.1 -0.9 1.0 1.0 0.0 0.1 1.3 0.9 0.1
1.0 -0.4 1.1 0.0 0.5 0.9 0.9 0.7 0.9 1.2 1.3 1.0 0.3 0.5 1.5 0.8 0.8 0.7 1.1 1.0 0.9 0.5 1.0 0.9 0.9 1.3 -1.6 1.1 0.6 0.9 -0.2 -0.9 -0.9 -0.8
0.4 0.8 0.8 0.6 0.4 -0.3 0.0 0.2 0.6 0.5 0.0 -0.1 -0.2 0.3 0.1 -1.0 1.3 0.5 0.3 0.8 0.1 0.0 0.7 1.4 0.6 0.5 0.9 0.0 0.5 1.0 1.0 0.1 0.5 0.6
1.0 0.2 1.2 2.0 0.5 -0.7 0.5 1.0 1.0 0.8 0.7 1.2 1.0 0.5 0.8 0.4 1.0 0.7 0.9 0.6 0.2 0.4 0.0 0.1 1.3 0.9 0.2 0.9 0.6 1.2 1.5 1.3
0.4 0.4 0.6 0.6 2.9 8.6 19.1 11.5 2.4 2.3 2.7 2.9 2.1 2.3 0.4 0.7 1.0 -0.1 2.6 2.5 4.3 0.8 1.2 -0.7 1.2
1.1 0.7 0.1 0.3 -0.8 1.2 2.0 2.4 1.0 2.8 2.7 -0.7 0.4 0.5 0.2 2.2 4.2 2.5 3.4 1.4 0.2 0.6 3.5 1.1
1.1 2.3 2.0 -0.2 0.2 0.8 0.2 0.6 1.3 -0.7 0.1 0.1 -0.1 1.6 2.4 -0.3 1.1 1.5 0.8 0.9 1.9 1.4
0.6 1.6 -0.5 0.7 0.4 -0.3 0.3 0.9 -0.4 -0.7 0.0 0.1 0.4 0.3 0.2 0.0 0.2 0.6
0.2 1.0 0.8 -0.3 0.2 1.5 0.4 -0.3 -3.9 0.1 -0.2 0.0 0.3 0.5
0.6 0.3 0.7 1.8 1.7 -0.1 0.4 1.4 0.6 0.5 0.3 -0.1 0.9 1.0 0.5
1.9

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). FEBRUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

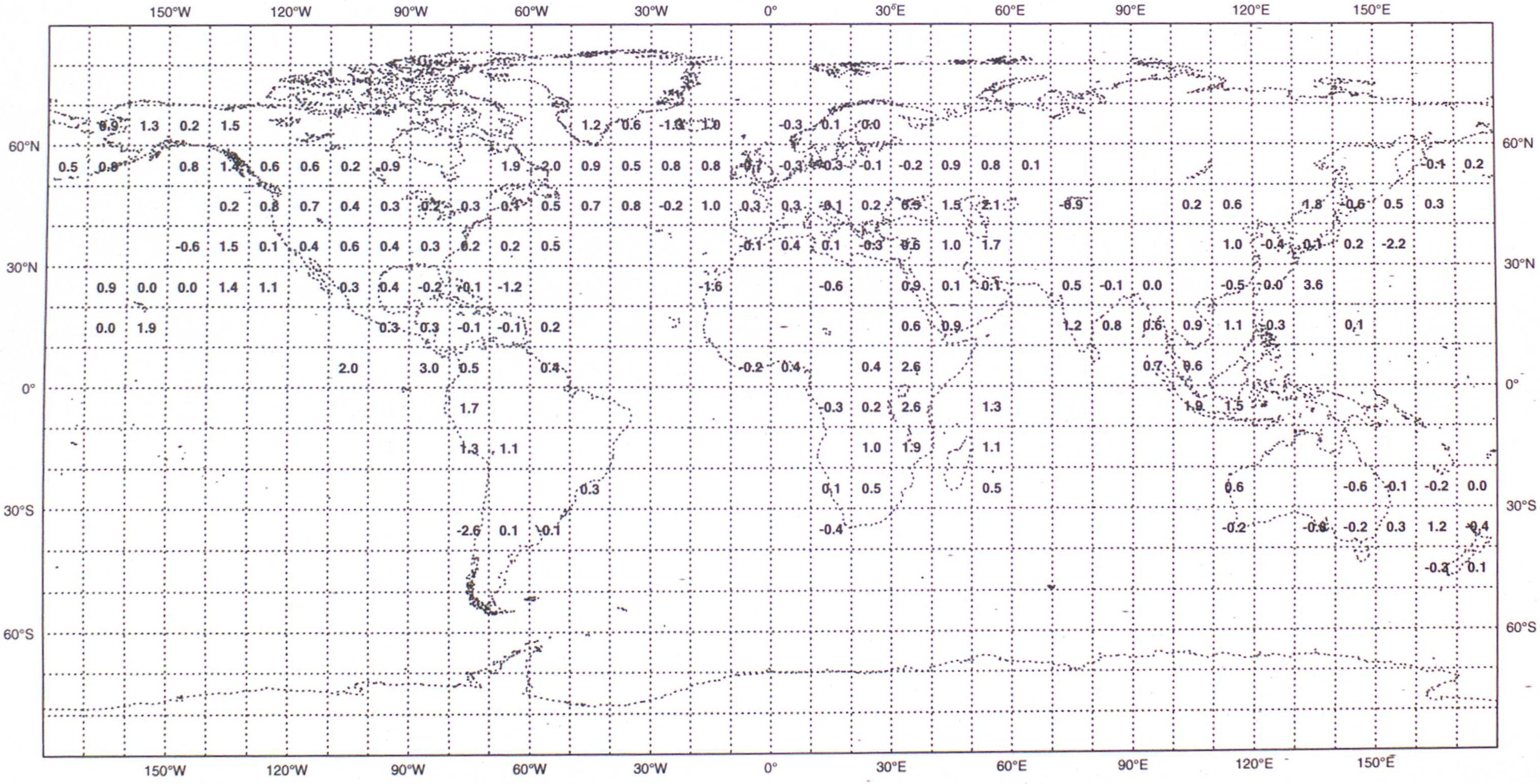

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). FEBRUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

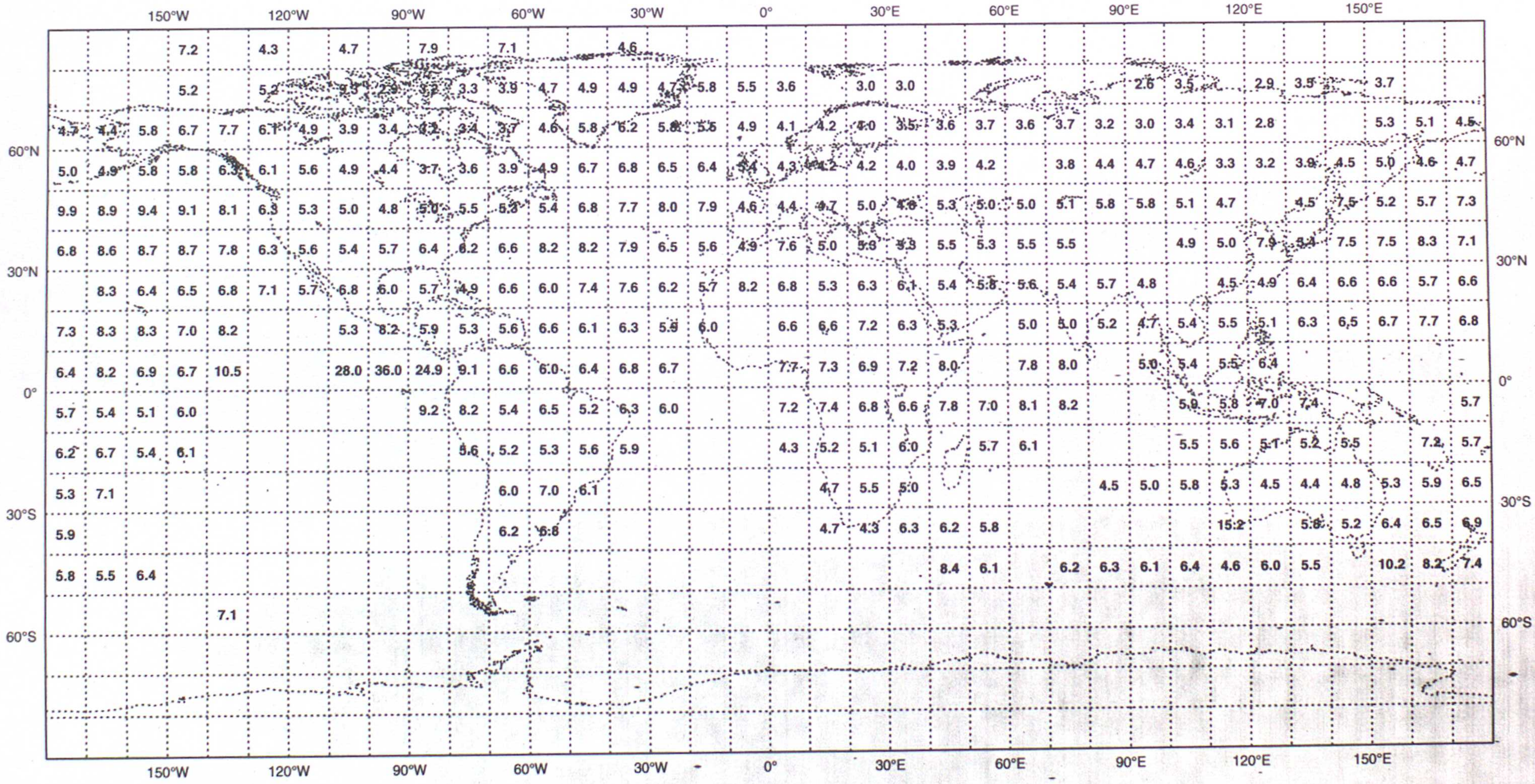

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
7.2 4.3 4.7 7.9 7.1 4.6
5.2 5.2 3.3 2.9 3.2 3.3 3.9 4.7 4.9 4.9 4.7 5.8 5.5 3.6 3.0 3.0 2.6 3.5 2.9 3.5 3.7
4.7 4.4 5.8 6.7 7.7 6.1 4.9 3.9 3.4 4.2 3.4 3.7 4.6 5.8 6.2 5.8 5.5 4.9 4.1 4.2 4.0 3.5 3.6 3.7 3.6 3.7 3.2 3.0 3.4 3.1 2.8 5.3 5.1 4.5
5.0 4.9 5.8 5.8 6.3 6.1 5.6 4.9 4.4 3.7 3.6 3.9 4.9 6.7 6.8 6.5 6.4 5.4 4.3 4.2 4.2 4.0 3.9 4.2 3.8 4.4 4.7 4.6 3.3 3.2 3.9 4.5 5.0 4.6 4.7
9.9 8.9 9.4 9.1 8.1 6.3 5.3 5.0 4.8 5.0 5.5 5.3 5.4 6.8 7.7 8.0 7.9 4.6 4.4 4.7 5.0 4.8 5.3 5.0 5.0 5.1 5.8 5.8 5.1 4.7 4.5 7.5 5.2 5.7 7.3
6.8 8.6 8.7 8.7 7.8 6.3 5.6 5.4 5.7 6.4 6.2 6.6 8.2 8.2 7.9 6.5 5.6 4.9 7.6 5.0 5.9 5.3 5.5 5.3 5.5 5.5 4.9 5.0 7.9 8.4 7.5 7.5 8.3 7.1
8.3 6.4 6.5 6.8 7.1 5.7 6.8 6.0 5.7 4.9 6.6 6.0 7.4 7.6 6.2 5.7 8.2 6.8 5.3 6.3 6.1 5.4 5.8 5.6 5.4 5.7 4.8 4.5 4.9 6.4 6.6 6.6 5.7 6.6
7.3 8.3 8.3 7.0 8.2 5.3 8.2 5.9 5.3 5.6 6.6 6.1 6.3 5.9 6.0 6.6 6.6 7.2 6.3 5.3 5.0 5.0 5.2 4.7 5.4 5.5 5.1 6.3 6.5 6.7 7.7 6.8
6.4 8.2 6.9 6.7 10.5 28.0 36.0 24.9 9.1 6.6 6.0 6.4 6.8 6.7 7.7 7.3 6.9 7.2 8.0 7.8 8.0 5.0 5.4 5.5 6.4
5.7 5.4 5.1 6.0 9.2 8.2 5.4 6.5 5.2 6.3 6.0 7.2 7.4 6.8 6.6 7.8 7.0 8.1 8.2 5.9 5.8 7.0 7.4 5.7
6.2 6.7 5.4 6.1 5.6 5.2 5.3 5.6 5.9 4.3 5.2 5.1 6.0 5.7 6.1 5.5 5.6 5.1 5.2 5.5 7.2 5.7
5.3 7.1 6.0 7.0 6.1 4.7 5.5 5.0 4.5 5.0 5.8 5.3 4.5 4.4 4.8 5.3 5.9 6.5
5.9 6.2 6.8 4.7 4.3 6.3 6.2 5.8 15.2 5.8 5.2 6.4 6.5 6.9
5.8 5.5 6.4 8.4 6.1 6.2 6.3 6.1 6.4 4.6 6.0 5.5 10.2 8.2 7.4
7.1
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). FEBRUARY 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

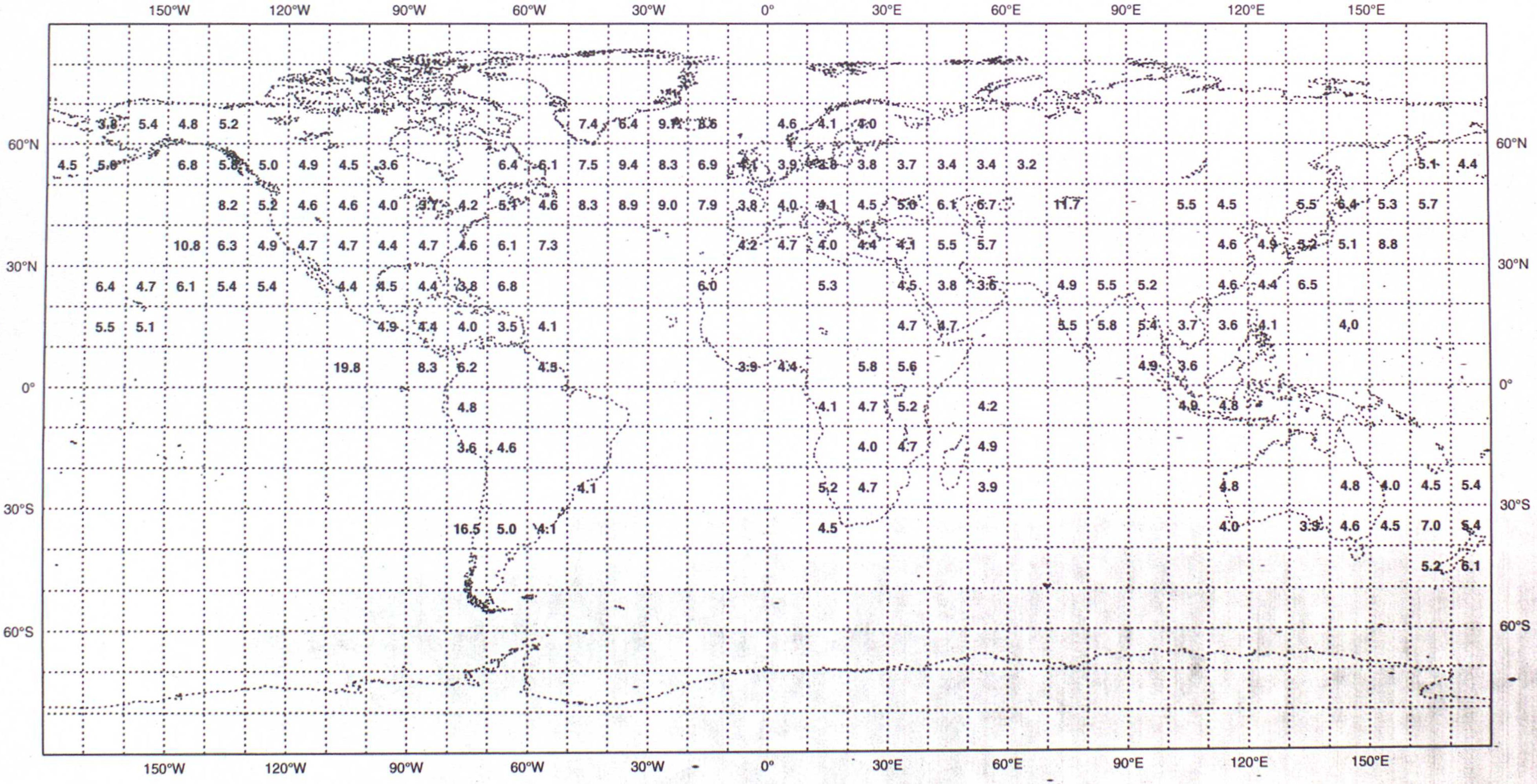

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3.8 5.4 4.8 5.2 7.4 6.4 9.1 8.6 4.6 4.1 4.0
4.5 5.8 6.8 5.8 5.0 4.9 4.5 3.6 6.4 6.1 7.5 9.4 8.3 6.9 4.1 3.9 2.8 3.8 3.7 3.4 3.4 3.2 5.1 4.4
8.2 5.2 4.6 4.6 4.0 3.7 4.2 5.1 4.6 8.3 8.9 9.0 7.9 3.8 4.0 4.1 4.5 5.0 6.1 6.7 11.7 5.5 4.5 5.5 6.4 5.3 5.7
10.8 6.3 4.9 4.7 4.7 4.4 4.7 4.6 6.1 7.3 4.2 4.7 4.0 4.4 4.1 5.5 5.7 4.6 4.9 5.2 5.1 8.8
6.4 4.7 6.1 5.4 5.4 4.4 4.5 4.4 3.8 6.8 6.0 5.3 4.5 3.8 3.6 4.9 5.5 5.2 4.6 4.4 6.5
5.5 5.1 4.9 4.4 4.0 3.5 4.1 4.7 4.7 5.5 5.8 5.4 3.7 3.6 4.1 4.0
19.8 8.3 6.2 4.5 3.9 4.4 5.8 5.6 4.9 3.6
4.8 4.1 4.7 5.2 4.2 4.9 4.8
3.6 4.6 4.0 4.7 4.9
4.1 5.2 4.7 3.9 4.8 4.8 4.0 4.5 5.4
16.5 5.0 4.1 4.5 4.0 3.9 4.6 4.5 7.0 5.4
5.2 6.1

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
20674	00	Z	150	73/ 80	21	0	94.0	20.1	96.2	5
27612	00	Z	1000	56/ 38	15	12	35.3	-40.1	53.4	4
42101	12	Z	150	30/ 76	15	0	82.3	-96.0	126.4	4
42182	00	Z	1000	29/ 77	11	12	9.1	-85.0	85.5	10
42182	12	Z	1000	29/ 77	8	19	7.3	-87.4	87.7	10
42339	00	Z	1000	26/ 73	7	18	3.6	-93.7	93.8	4
42339	12	Z	200	26/ 73	12	0	101.6	-25.8	104.9	4
42361	00	Z	1000	26/ 78	17	7	12.8	-79.9	80.9	5
42361	12	Z	1000	26/ 78	11	14	9.5	-85.4	85.9	7
42369	00	Z	250	27/ 81	17	0	44.5	-135.9	143.0	10
42369	12	Z	200	27/ 81	15	3	63.9	-106.5	124.2	9
42397	12	Z	250	27/ 88	14	0	76.3	-5.3	76.5	4
42410	12	Z	1000	26/ 92	2	19	1.0	-87.0	87.0	7
42492	00	Z	100	26/ 85	18	0	92.2	-113.5	146.2	7
42647	00	Z	200	23/ 73	10	0	41.1	-107.3	114.9	5
42724	12	Z	250	24/ 91	12	0	75.9	-26.4	80.4	4
42809	00	Z	150	23/ 88	22	0	99.6	-48.0	110.5	7
42809	12	Z	250	23/ 88	22	0	69.8	-41.6	81.2	7
42867	00	Z	200	21/ 79	14	1	108.7	-26.9	112.0	6
42867	12	Z	200	21/ 79	11	0	71.6	-61.8	94.6	4
43003	00	Z	1000	19/ 73	26	0	11.7	-54.6	55.8	11
43003	12	Z	1000	19/ 73	26	0	12.5	-60.1	61.4	13
43014	12	Z	300	20/ 75	24	2	66.1	78.4	102.5	6
43128	00	Z	850	17/ 78	22	1	23.1	30.5	38.2	4
43128	12	Z	250	17/ 78	20	3	76.8	83.0	113.1	12
43150	00	Z	1000	18/ 83	28	0	16.5	-71.2	73.1	5
43185	00	Z	1000	16/ 81	24	0	30.4	22.2	37.6	5
43185	12	Z	1000	16/ 81	19	0	39.1	34.4	52.1	13
43192	00	Z	1000	15/ 74	7	17	3.1	-93.7	93.8	9
43192	12	Z	1000	15/ 74	2	17	1.5	-96.5	96.5	5
43285	12	Z	1000	13/ 75	5	18	17.3	-66.4	68.6	7
43295	00	Z	850	13/ 78	23	2	25.0	35.1	43.1	7
43295	12	Z	50	13/ 78	13	2	122.8	212.5	245.4	11
43346	00	Z	50	11/ 80	10	0	92.7	139.1	167.2	5
43346	12	Z	70	11/ 80	18	0	133.8	70.4	151.2	7
43353	00	Z	1000	10/ 76	21	2	10.7	-77.5	78.3	5
43353	12	Z	1000	10/ 76	13	11	11.0	-88.6	89.3	5
43369	00	Z	200	8/ 73	13	0	85.5	-34.6	92.2	4
43369	12	Z	200	8/ 73	12	0	93.9	102.8	139.2	6
43371	00	Z	70	8/ 77	15	0	124.4	-136.1	184.4	10
43371	12	Z	50	8/ 77	16	1	124.2	161.6	203.8	6
58968	00	Z	30	25/ 122	17	0	50.5	225.8	231.3	4
78866	12	Z	850	18/ -63	19	2	44.0	7.4	44.6	5
78954	12	Z	50	13/ -59	23	0	26.9	152.5	154.9	4
91366	00	Z	50	9/ 168	26	1	118.5	173.8	210.3	4

Figure 8. TEMP 500 hPa geopotential mean daily count. FEBRUARY 2004
All hours
Global average number of observations in 24 hours = 1183

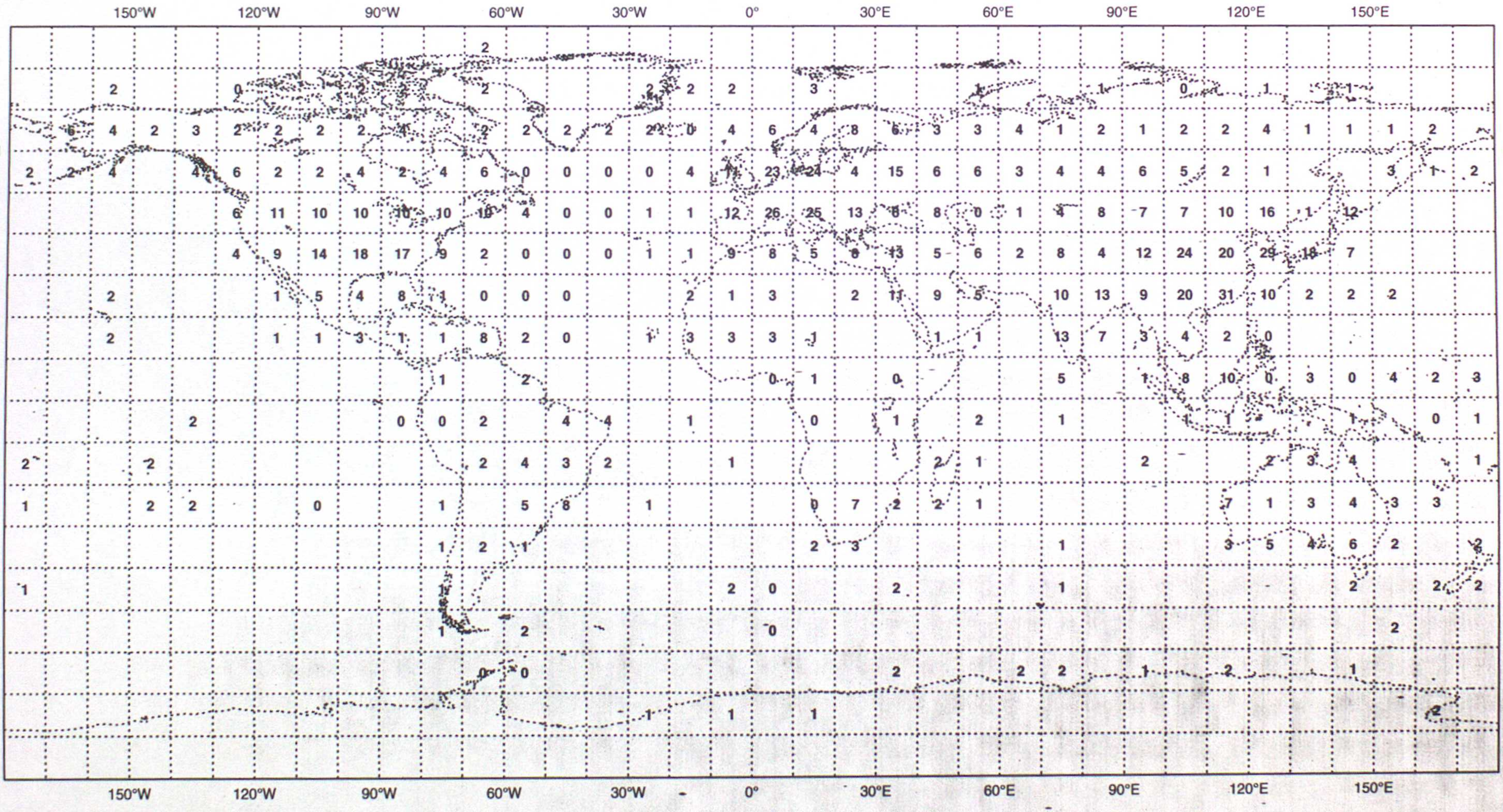

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
2
2 0 2 2 2 2 2 3 1 1 0 1 1
6 4 2 3 2 2 2 2 4 2 2 2 2 2 0 4 6 4 8 6 3 3 4 1 2 1 2 2 4 1 1 1 2
2 2 4 4 6 2 2 4 2 4 6 0 0 0 0 4 11 23 24 4 15 6 6 3 4 4 6 5 2 1 3 1 2
6 11 10 10 10 10 10 4 0 0 1 1 12 26 25 13 8 8 0 1 4 8 7 7 10 16 1 12
4 9 14 18 17 9 2 0 0 0 1 1 9 8 5 6 13 5 6 2 8 4 12 24 20 29 18 7
2 1 5 4 8 1 0 0 0 2 1 3 2 11 9 5 10 13 9 20 31 10 2 2 2
2 1 1 3 1 1 8 2 0 1 3 3 3 1 1 1 13 7 3 4 2 0
1 2 0 1 0 5 1 8 10 0 3 0 4 2 3
2 0 0 2 4 4 1 0 1 2 1 1 1 0 1
2 2 2 4 3 2 1 2 1 2 2 3 4 1
1 2 2 0 1 5 8 1 0 7 2 2 1 7 1 3 4 3 3
1 2 1 2 3 1 3 5 4 6 2 2
1 2 0 2 1 2 2 2
1 2 0 2
0 0 2 2 2 1 2 1
1 1 1 2

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
07110	00	V	500	48/ -4	28	0	7	-2.1	1.1	16.6	1
41718	12	V	500	29/ 71	15	0	100	-13.5	0.5	15.1	1
42027	12	V	300	34/ 75	10	0	100	-1.3	9.6	15.2	1
42101	12	V	250	30/ 76	14	0	14	-3.1	7.6	26.9	1
42182	00	V	250	29/ 77	18	0	100	-19.5	-3.5	24.5	4
42182	12	V	250	29/ 77	21	0	100	-20.4	-3.1	25.1	4
42361	00	V	300	26/ 78	10	0	90	5.1	6.9	18.6	1
42369	00	V	150	27/ 81	19	0	100	-9.8	-1.5	22.9	1
42369	12	V	150	27/ 81	18	0	100	-5.7	-0.1	15.1	1
42379	00	V	300	27/ 83	13	0	100	2.7	-6.4	22.2	2
42379	12	V	400	27/ 83	10	0	100	-7.4	-9.6	15.7	1
42410	12	V	250	26/ 92	11	0	100	4.9	6.5	18.1	2
47122	00	V	250	37/ 127	29	0	3	-0.6	2.8	21.0	1
48568	00	V	150	7/ 101	28	0	100	8.0	-12.6	19.4	1
48568	12	V	150	7/ 101	24	0	100	3.1	-11.5	17.3	1
60360	12	V	150	37/ 8	17	0	100	8.8	-3.9	21.0	2
60559	12	V	300	33/ 7	11	0	100	-6.9	0.3	18.0	1
60620	12	V	400	28/ 0	11	0	100	-15.6	3.0	22.7	1
61442	12	V	300	18/ -16	21	0	9	-0.1	-0.2	16.8	1
62337	00	V	200	31/ 34	25	0	100	-0.3	12.8	17.1	2
62337	12	V	250	31/ 34	21	0	100	0.8	11.2	19.6	4
62378	00	V	200	30/ 31	28	0	100	-18.8	-2.8	25.2	5
62378	12	V	200	30/ 31	28	0	100	-20.0	-1.5	25.5	5
62403	00	V	200	26/ 33	26	0	11	2.0	2.1	19.0	3
62403	12	V	100	26/ 33	22	0	18	-1.0	0.1	19.7	2
62414	00	V	150	24/ 33	25	0	4	-2.0	0.9	25.3	1
62414	12	V	150	24/ 33	13	0	7	-9.4	0.2	34.3	1
62423	12	V	400	27/ 28	25	0	4	-2.2	-2.8	22.6	1
68994	00	V	250	-47/ 38	19	0	5	0.7	4.4	20.6	1
72318	00	V	250	37/ -80	16	0	100	10.0	0.0	18.2	2
72376	00	V	300	37/-108	27	0	100	2.1	-4.4	17.9	2
72376	12	V	250	37/-108	26	0	100	3.5	-4.6	19.6	4
72493	12	V	200	38/-122	21	0	9	1.1	-3.3	16.0	1
78866	12	V	1000	18/ -63	21	0	14	7.0	-0.5	15.1	1
85586	12	V	200	-34/ -72	15	0	6	-3.3	0.4	19.0	1
87155	12	V	200	-27/ -59	22	0	4	-0.2	1.6	16.2	1
89571	00	V	300	-69/ 78	20	0	5	-1.4	-3.0	15.7	1
96481	00	V	100	4/ 118	24	0	12	8.2	-1.9	15.8	1
96481	12	V	100	4/ 118	25	0	4	10.4	-1.1	16.2	1
97014	00	V	100	2/ 125	13	0	100	15.9	-1.7	18.2	1
97072	00	V	100	-1/ 120	10	0	20	15.7	-3.2	21.1	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. FEBRUARY 2004
All hours
Global average number of observations in 24 hours = 1367

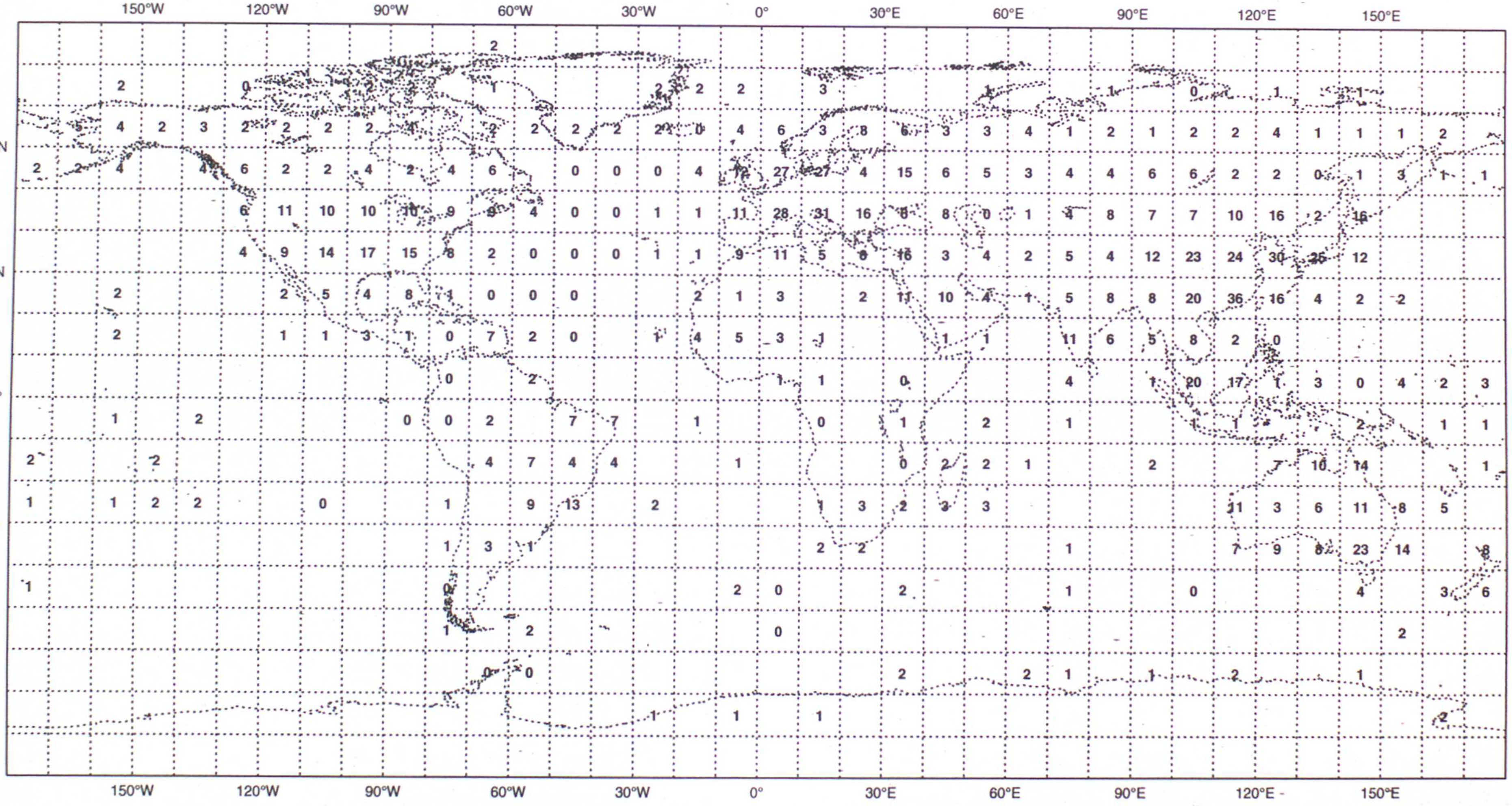

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA

:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
33791	12	DD	48/ 33	24	-11.9	3.4	9.9
42379	12	DD	27/ 83	6	15.8	3.5	9.3
42397	12	DD	27/ 88	5	10.7	8.1	8.1
42701	00	DD	23/ 85	9	10.3	8.3	13.8
62337	00	DD	31/ 34	26	-16.3	2.5	7.4
62337	12	DD	31/ 34	22	-14.9	2.6	7.3
78954	12	DD	13/ -59	24	-17.5	6.0	15.4
82193	00	DD	-1/ -48	14	-10.2	9.2	23.7

MONITORING OF SATELLITE WINDS

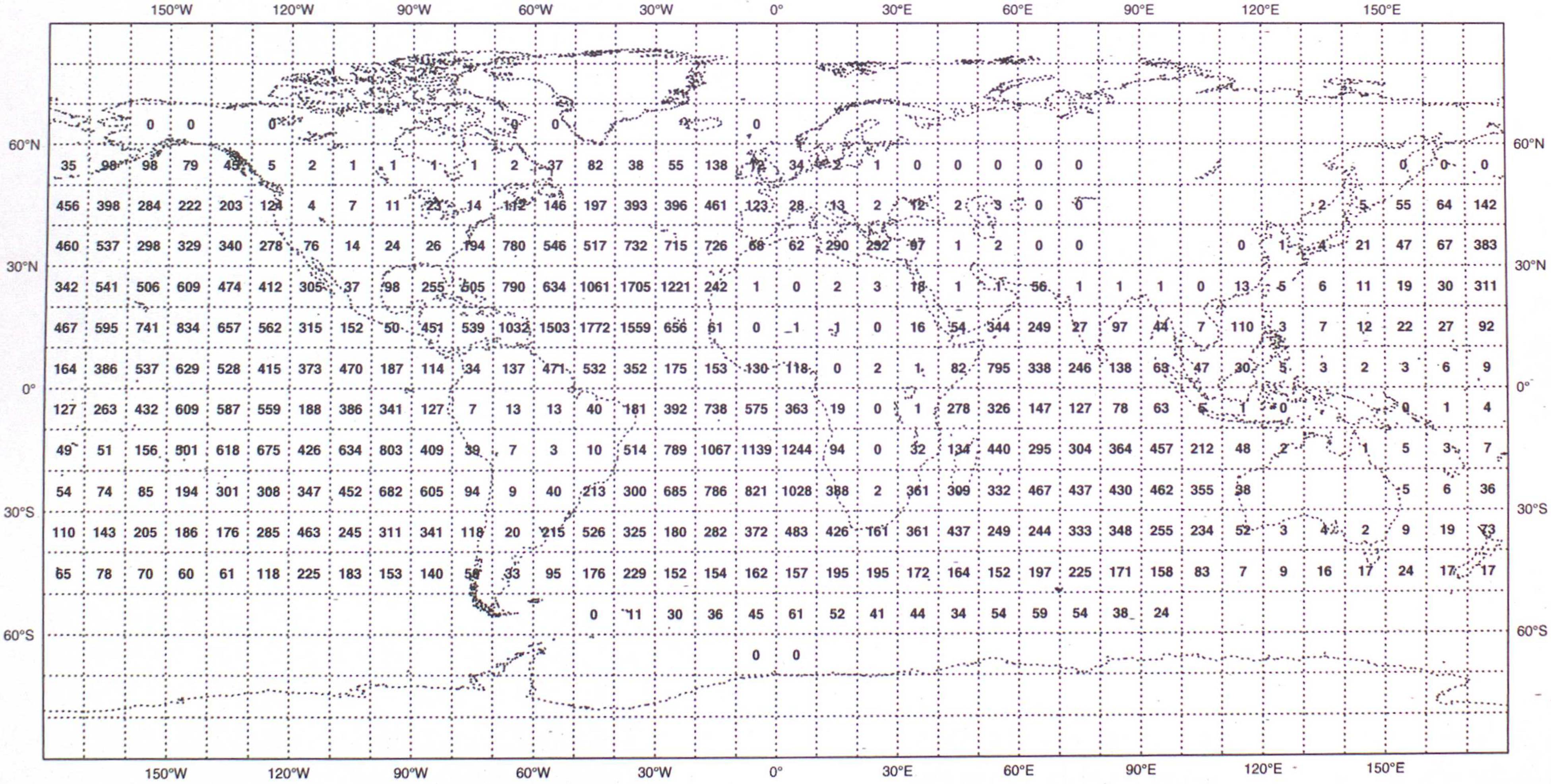
MONITORING CENTRE: EXETER

MONTH: Feb 2004

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES-9, GOES-10, GOES-12, METEOSAT-5, METEOSAT-7
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa
	:Mean wind
	:Mean observation minus background vector wind differences
	:Mean observation minus background speed differences
	:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. FEBRUARY 2004
Global average number of observations in 24 hours = 85675



		0	0		0						0	0					0																		
35	98	98	79	45	5	2	1	1	1	1	2	37	82	38	55	138	72	34	2	1	0	0	0	0	0								0	0	0
456	398	284	222	203	124	4	7	11	23	14	112	146	197	393	396	461	123	28	13	2	12	2	3	0	0						2	5	55	64	142
460	537	298	329	340	278	76	14	24	26	194	780	546	517	732	715	726	68	62	290	292	87	1	2	0	0				0	1	4	21	47	67	383
342	541	506	609	474	412	305	37	98	255	505	790	634	1061	1705	1221	242	1	0	2	3	18	1	1	56	1	1	1	0	13	5	6	11	19	30	311
467	595	741	834	657	562	315	152	50	451	539	1032	1503	1772	1559	656	61	0	1	1	0	16	54	344	249	27	97	44	7	110	3	7	12	22	27	92
164	386	537	629	528	415	373	470	187	114	34	137	471	532	352	175	153	130	118	0	2	1	82	795	338	246	138	68	47	30	5	3	2	3	6	9
127	263	432	609	587	559	188	386	341	127	7	13	13	40	181	392	738	575	363	19	0	1	278	326	147	127	78	63	6	1	0			0	1	4
49	51	156	501	618	675	426	634	803	409	39	7	3	10	514	789	1067	1139	1244	94	0	32	134	440	295	304	364	457	212	48	2		1	5	3	7
54	74	85	194	301	308	347	452	682	605	94	9	40	213	300	685	786	821	1028	388	2	361	309	332	467	437	430	462	355	38				5	6	36
110	143	205	186	176	285	463	245	311	341	118	20	215	526	325	180	282	372	483	426	161	361	437	249	244	333	348	255	234	52	3	4	2	9	19	73
65	78	70	60	61	118	225	183	153	140	58	33	95	176	229	152	154	162	157	195	195	172	164	152	197	225	171	158	83	7	9	16	17	24	17	17
													0	11	30	36	45	61	52	41	44	34	54	59	54	38	24								
																	0	0																	

Figure 11. SATOB 701 - 1000 hPa vector mean wind. FEBRUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

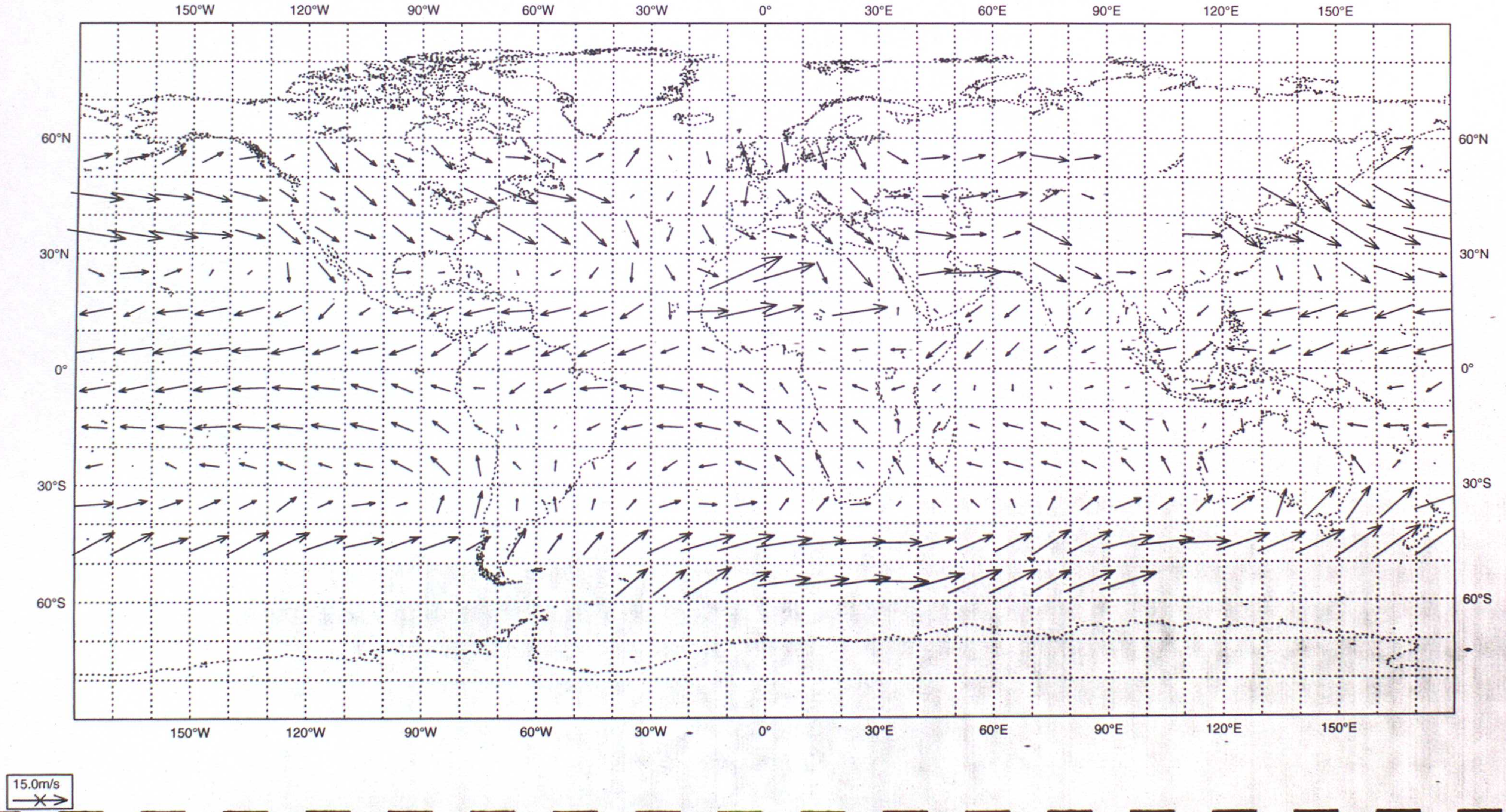

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. FEBRUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

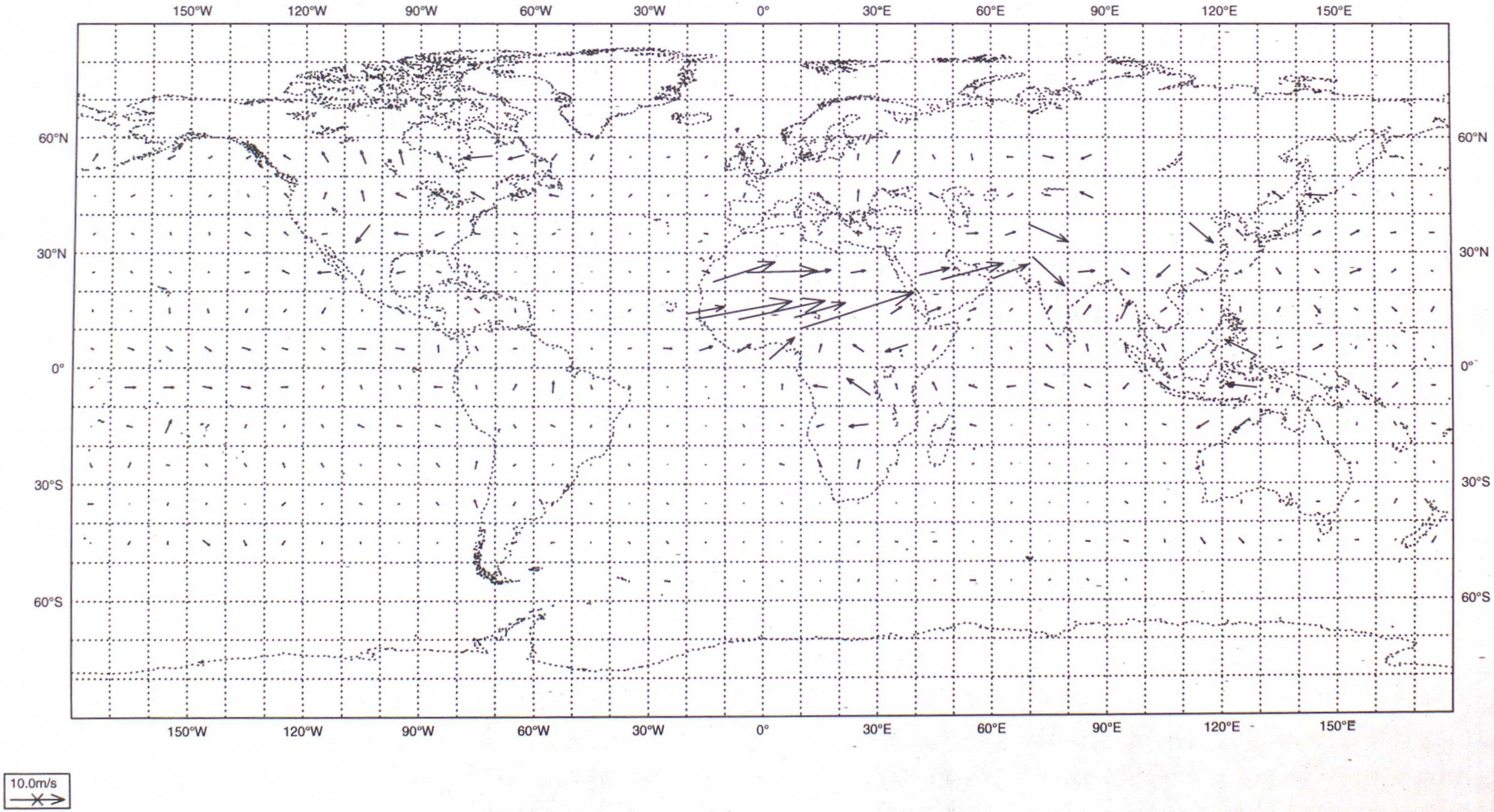

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). FEBRUARY 2004
All observations
Values are plotted where greater than 10 obs are present

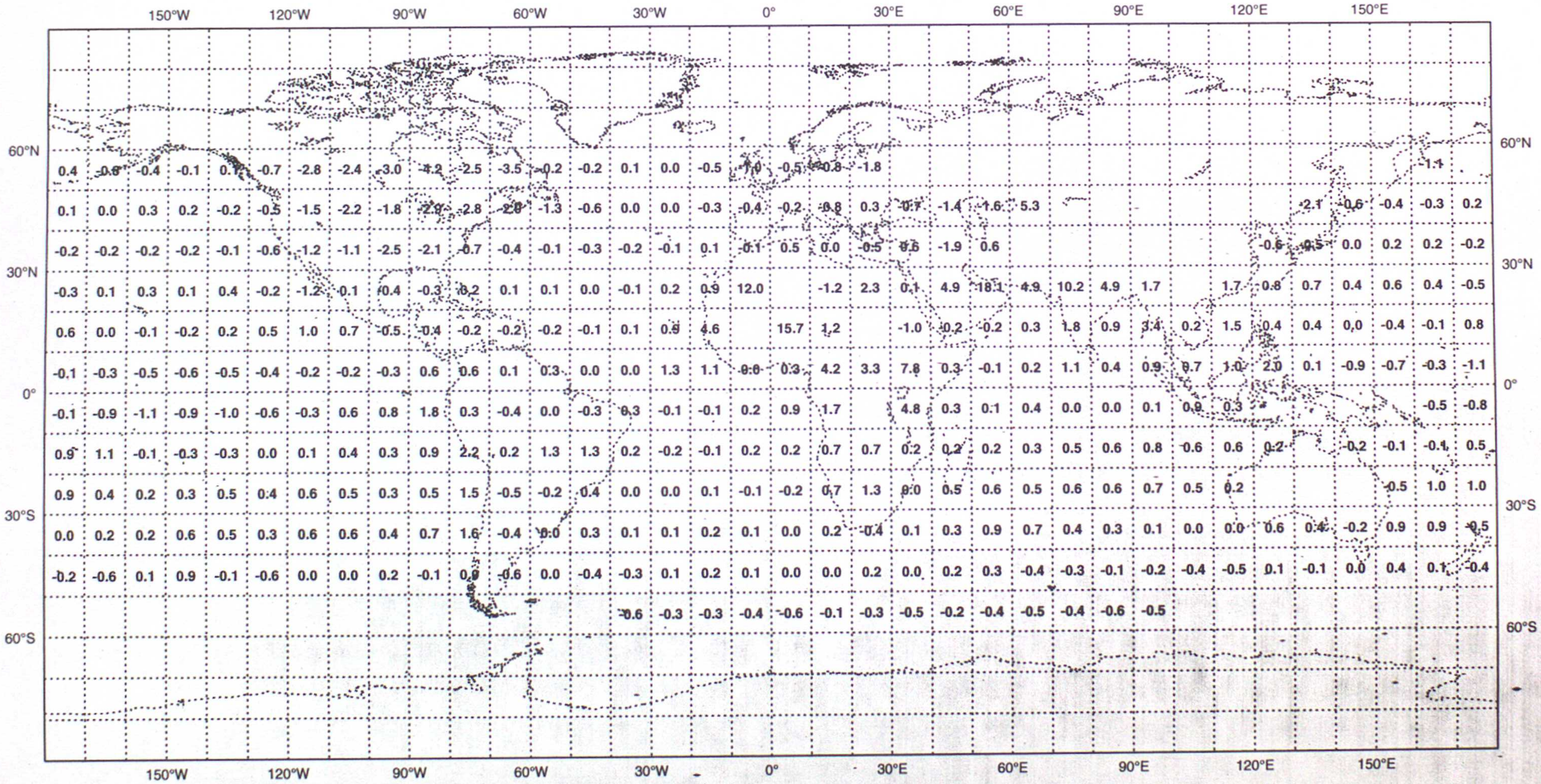

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.4 -0.6 -0.4 -0.1 0.1 -0.7 -2.8 -2.4 -3.0 -4.2 -2.5 -3.5 -0.2 -0.2 0.1 0.0 -0.5 -1.0 -0.5 -0.8 -1.8 -1.1
0.1 0.0 0.3 0.2 -0.2 -0.5 -1.5 -2.2 -1.8 -2.9 -2.8 -2.8 -1.3 -0.6 0.0 0.0 -0.3 -0.4 -0.2 -0.8 0.3 -0.7 -1.4 -1.6 5.3 -2.1 -0.6 -0.4 -0.3 0.2
-0.2 -0.2 -0.2 -0.2 -0.1 -0.6 -1.2 -1.1 -2.5 -2.1 -0.7 -0.4 -0.1 -0.3 -0.2 -0.1 0.1 -0.1 0.5 0.0 -0.5 0.6 -1.9 0.6 -0.6 -0.5 0.0 0.2 0.2 -0.2
-0.3 0.1 0.3 0.1 0.4 -0.2 -1.2 -0.1 0.4 -0.3 0.2 0.1 0.1 0.0 -0.1 0.2 0.9 12.0 -1.2 2.3 0.1 4.9 18.1 4.9 10.2 4.9 1.7 1.7 0.8 0.7 0.4 0.6 0.4 -0.5
0.6 0.0 -0.1 -0.2 0.2 0.5 1.0 0.7 -0.5 -0.4 -0.2 -0.2 -0.2 -0.1 0.1 0.9 4.6 15.7 1.2 -1.0 -0.2 -0.2 0.3 1.8 0.9 3.4 0.2 1.5 0.4 0.4 0,0 -0.4 -0.1 0.8
-0.1 -0.3 -0.5 -0.6 -0.5 -0.4 -0.2 -0.2 -0.3 0.6 0.6 0.1 0.3 0.0 0.0 1.3 1.1 0.0 0.3 4.2 3.3 7.8 0.3 -0.1 0.2 1.1 0.4 0.9 0.7 1.0 2.0 0.1 -0.9 -0.7 -0.3 -1.1
-0.1 -0.9 -1.1 -0.9 -1.0 -0.6 -0.3 0.6 0.8 1.8 0.3 -0.4 0.0 -0.3 0.3 -0.1 -0.1 0.2 0.9 1.7 4.8 0.3 0.1 0.4 0.0 0.0 0.1 0.9 0.3 -0.5 -0.8
0.9 1.1 -0.1 -0.3 -0.3 0.0 0.1 0.4 0.3 0.9 2.2 0.2 1.3 1.3 0.2 -0.2 -0.1 0.2 0.2 0.7 0.7 0.2 0.2 0.2 0.3 0.5 0.6 0.8 -0.6 0.6 0.2 -0.2 -0.1 -0.1 0.5
0.9 0.4 0.2 0.3 0.5 0.4 0.6 0.5 0.3 0.5 1.5 -0.5 -0.2 0.4 0.0 0.0 0.1 -0.1 -0.2 0.7 1.3 0.0 0.5 0.6 0.5 0.6 0.6 0.7 0.5 0.2 -0.5 1.0 1.0
0.0 0.2 0.2 0.6 0.5 0.3 0.6 0.6 0.4 0.7 1.6 -0.4 0.0 0.3 0.1 0.1 0.2 0.1 0.0 0.2 -0.4 0.1 0.3 0.9 0.7 0.4 0.3 0.1 0.0 0.0 0.6 0.4 -0.2 0.9 0.9 -0.5
-0.2 -0.6 0.1 0.9 -0.1 -0.6 0.0 0.0 0.2 -0.1 0.0 -0.6 0.0 -0.4 -0.3 0.1 0.2 0.1 0.0 0.0 0.2 0.0 0.2 0.3 -0.4 -0.3 -0.1 -0.2 -0.4 -0.5 0.1 -0.1 0.0 0.4 0.1 -0.4
-0.6 -0.3 -0.3 -0.4 -0.6 -0.1 -0.3 -0.5 -0.2 -0.4 -0.5 -0.4 -0.6 -0.5

Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). FEBRUARY 2004
All observations
Values are plotted where greater than 10 obs are present

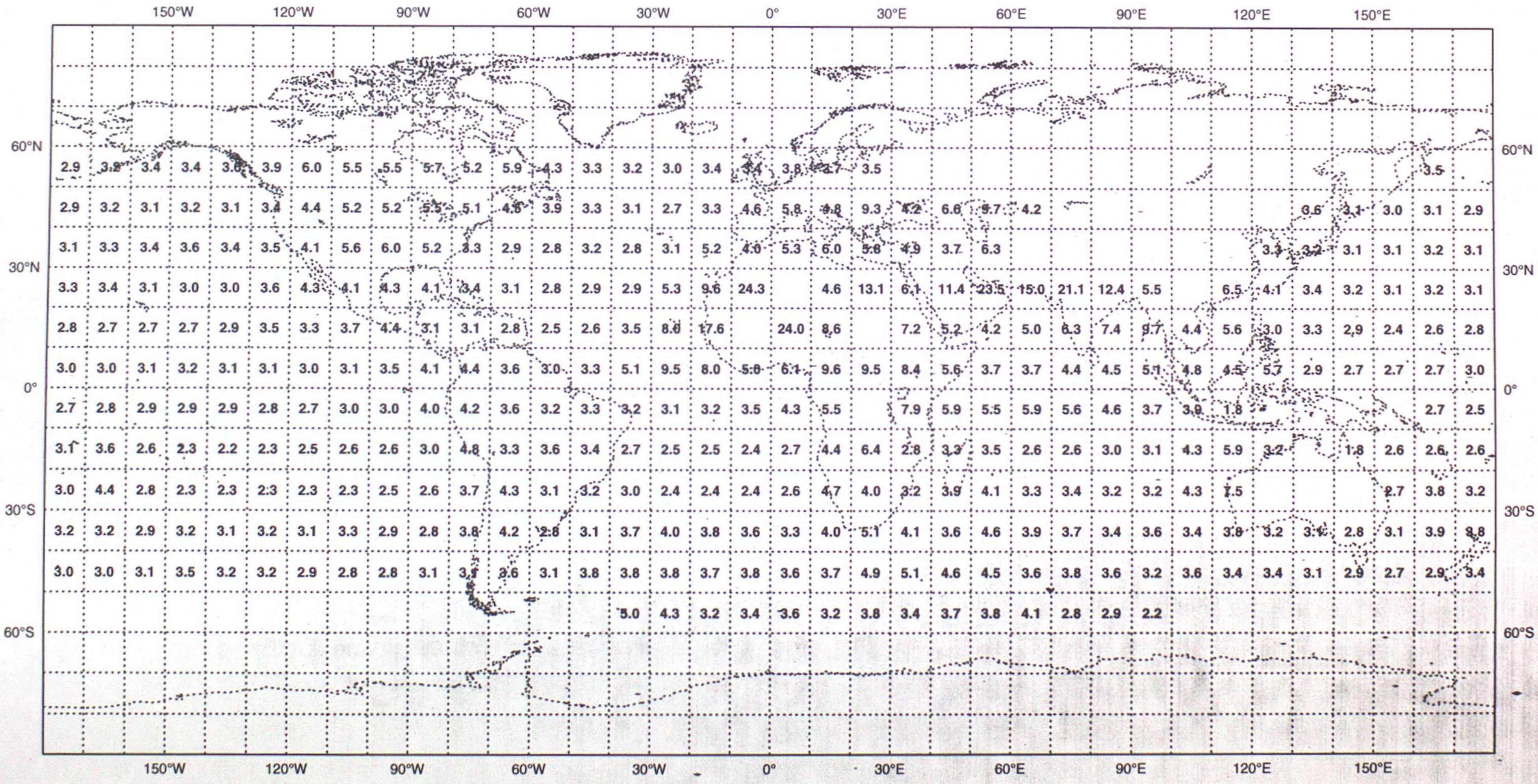

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2.9 3.8 3.4 3.4 3.6 3.9 6.0 5.5 5.5 5.7 5.2 5.9 4.3 3.3 3.2 3.0 3.4 3.4 3.8 2.7 3.5 3.5
2.9 3.2 3.1 3.2 3.1 3.4 4.4 5.2 5.2 5.5 5.1 4.6 3.9 3.3 3.1 2.7 3.3 4.6 5.8 4.8 9.3 4.2 6.6 5.7 4.2 3.6 3.1 3.0 3.1 2.9
3.1 3.3 3.4 3.6 3.4 3.5 4.1 5.6 6.0 5.2 3.3 2.9 2.8 3.2 2.8 3.1 5.2 4.0 5.3 6.0 5.6 4.9 3.7 6.3 3.3 3.2 3.1 3.1 3.2 3.1
3.3 3.4 3.1 3.0 3.0 3.6 4.3 4.1 4.3 4.1 3.4 3.1 2.8 2.9 2.9 5.3 9.6 24.3 4.6 13.1 6.1 11.4 23.5 15.0 21.1 12.4 5.5 6.5 4.1 3.4 3.2 3.1 3.2 3.1
2.8 2.7 2.7 2.7 2.9 3.5 3.3 3.7 4.4 3.1 3.1 2.8 2.5 2.6 3.5 8.0 17.6 24.0 8.6 7.2 5.2 4.2 5.0 6.3 7.4 9.7 4.4 5.6 3.0 3.3 2.9 2.4 2.6 2.8
3.0 3.0 3.1 3.2 3.1 3.1 3.0 3.1 3.5 4.1 4.4 3.6 3.0 3.3 5.1 9.5 8.0 5.8 6.1 9.6 9.5 8.4 5.6 3.7 3.7 4.4 4.5 5.1 4.8 4.5 5.7 2.9 2.7 2.7 2.7 3.0
2.7 2.8 2.9 2.9 2.9 2.8 2.7 3.0 3.0 4.0 4.2 3.6 3.2 3.3 3.2 3.1 3.2 3.5 4.3 5.5 7.9 5.9 5.5 5.9 5.6 4.6 3.7 3.9 1.8 2.7 2.5
3.1 3.6 2.6 2.3 2.2 2.3 2.5 2.6 2.6 3.0 4.8 3.3 3.6 3.4 2.7 2.5 2.5 2.4 2.7 4.4 6.4 2.8 3.3 3.5 2.6 2.6 3.0 3.1 4.3 5.9 3.2 1.8 2.6 2.6 2.6
3.0 4.4 2.8 2.3 2.3 2.3 2.3 2.3 2.5 2.6 3.7 4.3 3.1 3.2 3.0 2.4 2.4 2.4 2.6 4.7 4.0 3.2 3.9 4.1 3.3 3.4 3.2 3.2 4.3 7.5 2.7 3.8 3.2
3.2 3.2 2.9 3.2 3.1 3.2 3.1 3.3 2.9 2.8 3.8 4.2 2.8 3.1 3.7 4.0 3.8 3.6 3.3 4.0 5.1 4.1 3.6 4.6 3.9 3.7 3.4 3.6 3.4 3.8 3.2 3.1 2.8 3.1 3.9 3.8
3.0 3.0 3.1 3.5 3.2 3.2 2.9 2.8 2.8 3.1 3.1 2.6 3.1 3.8 3.8 3.8 3.7 3.8 3.6 3.7 4.9 5.1 4.6 4.5 3.6 3.8 3.6 3.2 3.6 3.4 3.4 3.1 2.9 2.7 2.9 3.4
5.0 4.3 3.2 3.4 3.6 3.2 3.8 3.4 3.7 3.8 4.1 2.8 2.9 2.2

Figure 15. SATOB 401 - 700 hPa mean daily count. FEBRUARY 2004
Global average number of observations in 24 hours = 19840

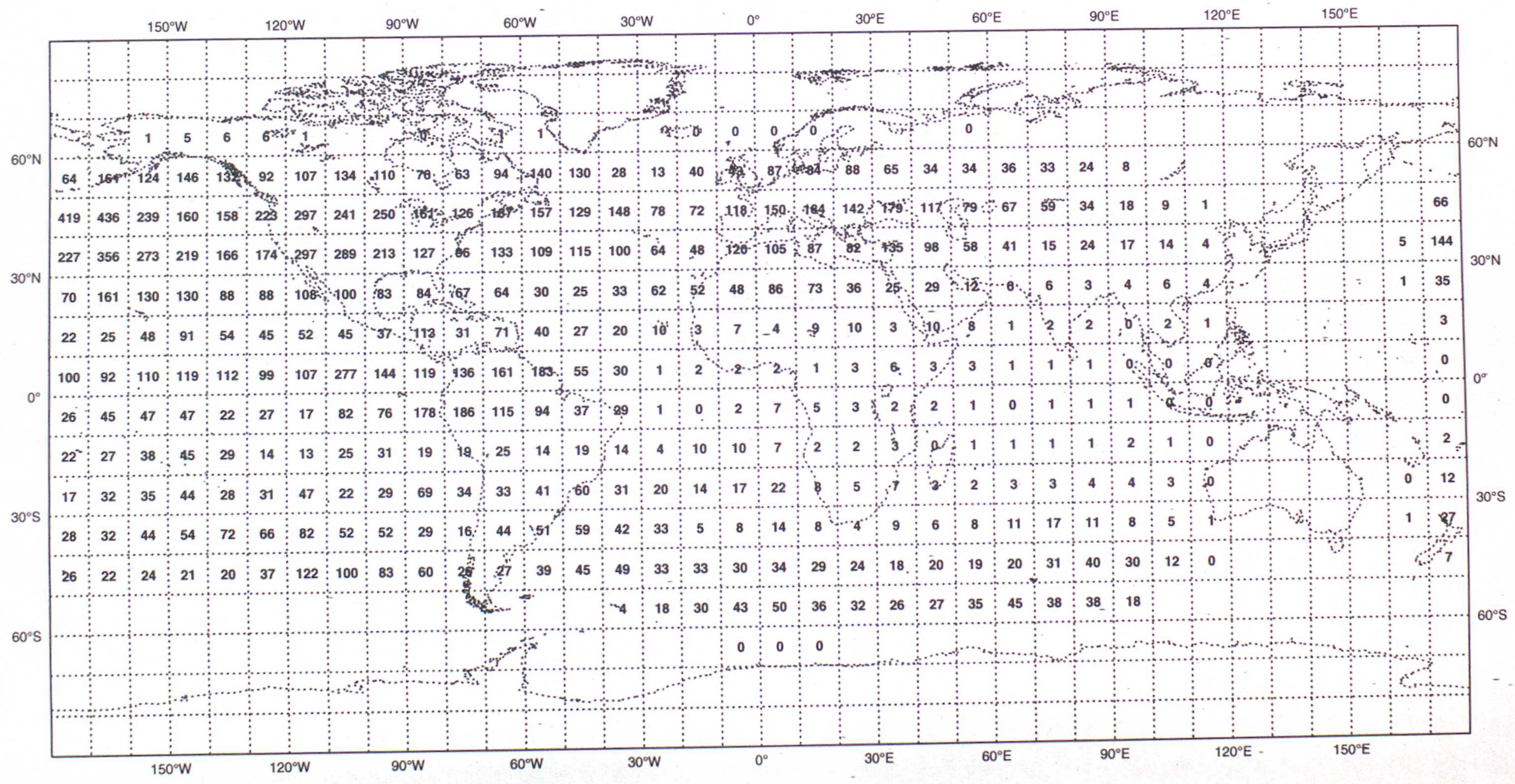

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 5 6 6 1 1 0 0 0 0 0 0
64 164 124 146 132 92 107 134 110 76 63 94 140 130 28 13 40 92 87 84 88 65 34 34 36 33 24 8
419 436 239 160 158 223 297 241 250 161 126 187 157 129 148 78 72 118 150 184 142 179 117 79 67 59 34 18 9 1 66
227 356 273 219 166 174 297 289 213 127 86 133 109 115 100 64 48 126 105 87 82 135 98 58 41 15 24 17 14 4 5 144
70 161 130 130 88 88 108 100 83 84 67 64 30 25 33 62 52 48 86 73 36 25 29 12 6 6 3 4 6 4 1 35
22 25 48 91 54 45 52 45 37 113 31 71 40 27 20 10 3 7 4 9 10 3 10 8 1 2 2 0 2 1 3
100 92 110 119 112 99 107 277 144 119 136 161 183 55 30 1 2 2 2 1 3 6 3 3 1 1 1 0 0 0 0
26 45 47 47 22 27 17 82 76 178 186 115 94 37 29 1 0 2 7 5 3 2 2 1 0 1 1 1 0 0 0
22 27 38 45 29 14 13 25 31 19 19 25 14 19 14 4 10 10 7 2 2 3 0 1 1 1 1 2 1 0 2
17 32 35 44 28 31 47 22 29 69 34 33 41 60 31 20 14 17 22 8 5 7 3 2 3 3 4 4 3 0 0 12
28 32 44 54 72 66 82 52 52 29 16 44 51 59 42 33 5 8 14 8 4 9 6 8 11 17 11 8 5 1 1 27
26 22 24 21 20 37 122 100 83 60 26 27 39 45 49 33 33 30 34 29 24 18 20 19 20 31 40 30 12 0 7
4 18 30 43 50 36 32 26 27 35 45 38 38 18
0 0 0

Figure 16. SATOB 401 - 700 hPa vector mean wind. FEBRUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

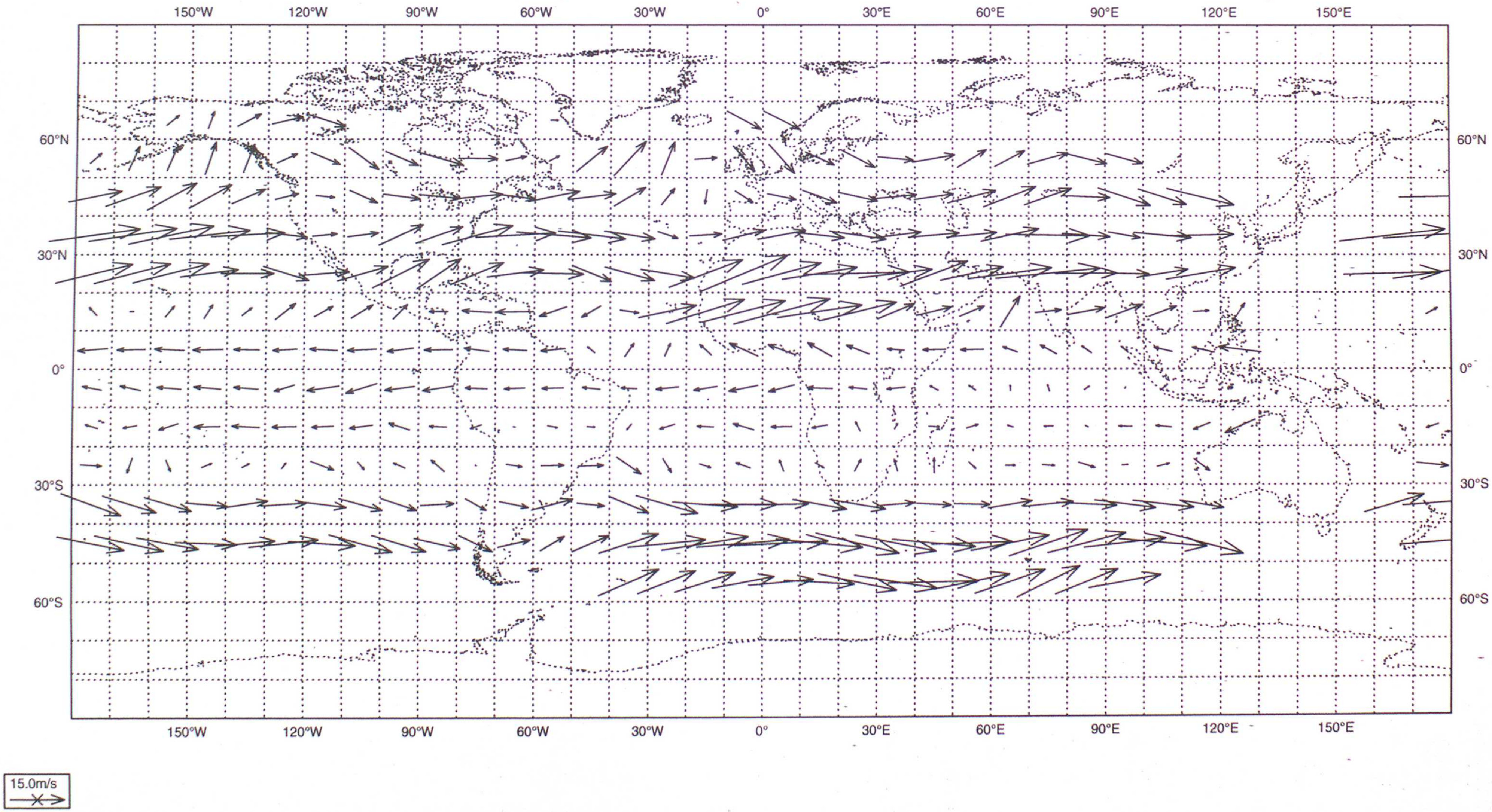

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. FEBRUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

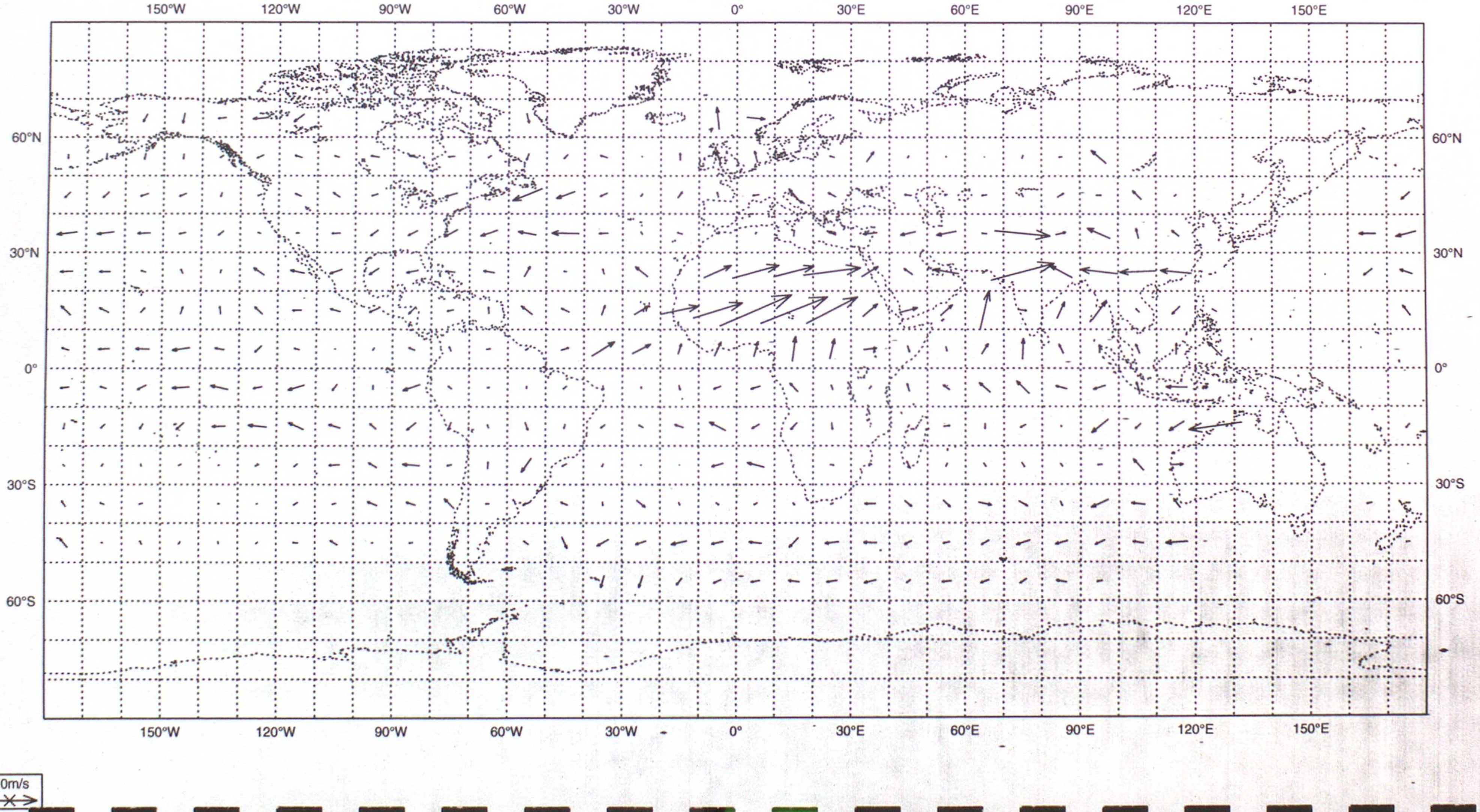

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). FEBRUARY 2004
All observations
Values are plotted where greater than 10 obs are present

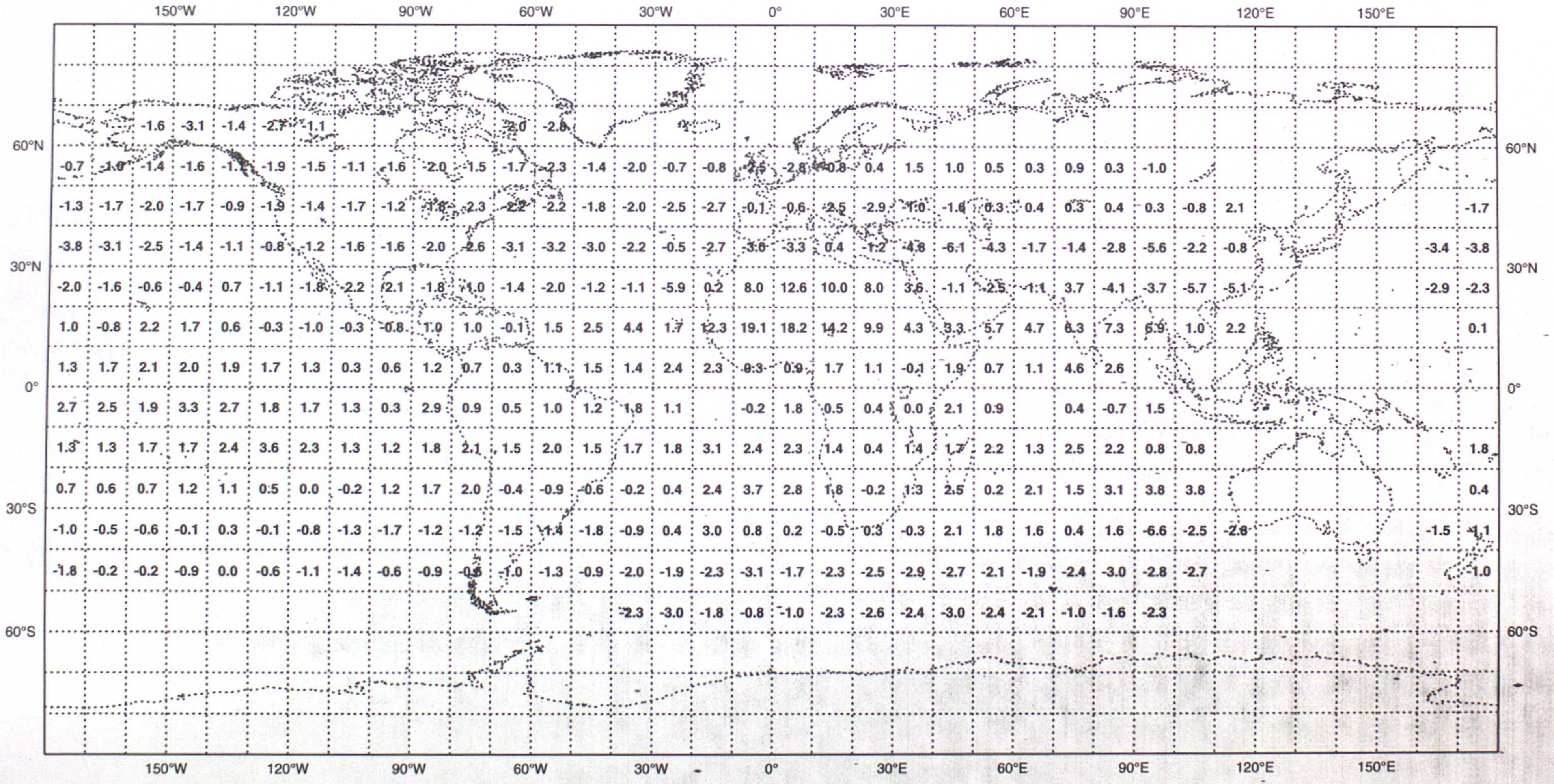

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.6 -3.1 -1.4 -2.7 -1.1 -2.0 -2.8
-0.7 -1.6 -1.4 -1.6 -1.9 -1.5 -1.1 -1.6 -2.0 -1.5 -1.7 -2.3 -1.4 -2.0 -0.7 -0.8 -2.5 -2.8 -0.8 0.4 1.5 1.0 0.5 0.3 0.9 0.3 -1.0
-1.3 -1.7 -2.0 -1.7 -0.9 -1.9 -1.4 -1.7 -1.2 -1.8 -2.3 -2.2 -2.2 -1.8 -2.0 -2.5 -2.7 -0.1 -0.6 -2.5 -2.9 -1.0 -1.6 -0.3 0.4 0.3 0.4 0.3 -0.8 2.1 -1.7
-3.8 -3.1 -2.5 -1.4 -1.1 -0.8 -1.2 -1.6 -1.6 -2.0 -2.6 -3.1 -3.2 -3.0 -2.2 -0.5 -2.7 -3.6 -3.3 0.4 -1.2 -4.8 -6.1 -4.3 -1.7 -1.4 -2.8 -5.6 -2.2 -0.8 -3.4 -3.8
-2.0 -1.6 -0.6 -0.4 0.7 -1.1 -1.8 -2.2 -2.1 -1.8 -1.0 -1.4 -2.0 -1.2 -1.1 -5.9 0.2 8.0 12.6 10.0 8.0 3.6 -1.1 -2.5 -1.1 3.7 -4.1 -3.7 -5.7 -5.1 -2.9 -2.3
1.0 -0.8 2.2 1.7 0.6 -0.3 -1.0 -0.3 -0.8 1.0 1.0 -0.1 1.5 2.5 4.4 1.7 12.3 19.1 18.2 14.2 9.9 4.3 3.3 5.7 4.7 6.3 7.3 6.9 1.0 2.2 0.1
1.3 1.7 2.1 2.0 1.9 1.7 1.3 0.3 0.6 1.2 0.7 0.3 1.1 1.5 1.4 2.4 2.3 0.3 0.9 1.7 1.1 -0.1 1.9 0.7 1.1 4.6 2.6
2.7 2.5 1.9 3.3 2.7 1.8 1.7 1.3 0.3 2.9 0.9 0.5 1.0 1.2 1.8 1.1 -0.2 1.8 0.5 0.4 0.0 2.1 0.9 0.4 -0.7 1.5
1.3 1.3 1.7 1.7 2.4 3.6 2.3 1.3 1.2 1.8 2.1 1.5 2.0 1.5 1.7 1.8 3.1 2.4 2.3 1.4 0.4 1.4 1.7 2.2 1.3 2.5 2.2 0.8 0.8 1.8
0.7 0.6 0.7 1.2 1.1 0.5 0.0 -0.2 1.2 1.7 2.0 -0.4 -0.9 -0.6 -0.2 0.4 2.4 3.7 2.8 1.8 -0.2 1.3 2.5 0.2 2.1 1.5 3.1 3.8 3.8 0.4
-1.0 -0.5 -0.6 -0.1 0.3 -0.1 -0.8 -1.3 -1.7 -1.2 -1.2 -1.5 -1.4 -1.8 -0.9 0.4 3.0 0.8 0.2 -0.5 0.3 -0.3 2.1 1.8 1.6 0.4 1.6 -6.6 -2.5 -2.8 -1.5 -1.1
-1.8 -0.2 -0.2 -0.9 0.0 -0.6 -1.1 -1.4 -0.6 -0.9 -0.5 -1.0 -1.3 -0.9 -2.0 -1.9 -2.3 -3.1 -1.7 -2.3 -2.5 -2.9 -2.7 -2.1 -1.9 -2.4 -3.0 -2.8 -2.7 -1.0
-2.3 -3.0 -1.8 -0.8 -1.0 -2.3 -2.6 -2.4 -3.0 -2.4 -2.1 -1.0 -1.6 -2.3

Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms-1). FEBRUARY 2004
All observations
Values are plotted where greater than 10 obs are present

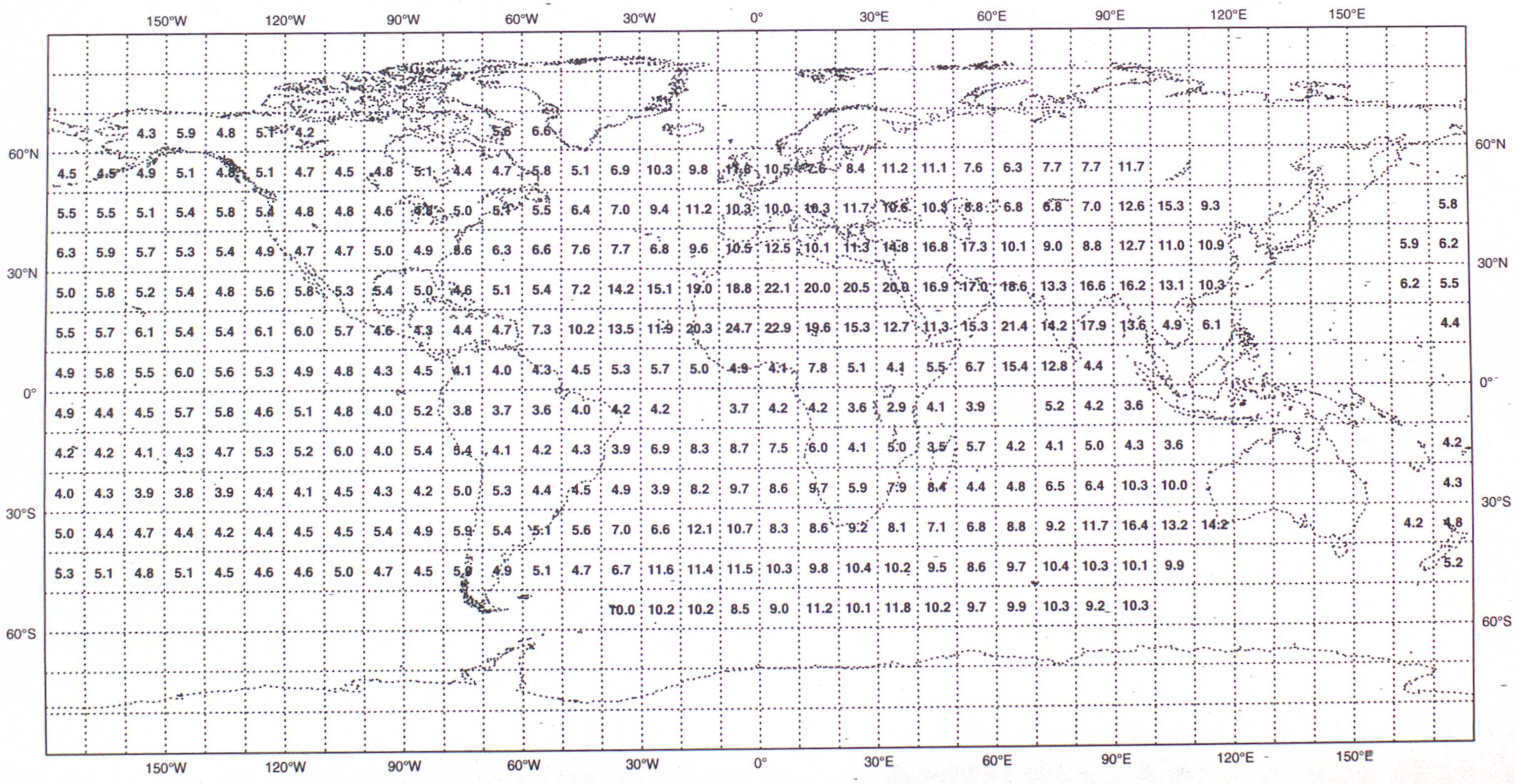

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
4.3 5.9 4.8 5.1 4.2 5.6 6.6
4.5 4.5 4.9 5.1 4.8 5.1 4.7 4.5 4.8 5.1 4.4 4.7 5.8 5.1 6.9 10.3 9.8 11.8 10.5 12.6 8.4 11.2 11.1 7.6 6.3 7.7 7.7 11.7
5.5 5.5 5.1 5.4 5.8 5.4 4.8 4.8 4.6 4.8 5.0 5.1 5.5 6.4 7.0 9.4 11.2 10.3 10.0 10.3 11.7 10.6 10.3 8.8 6.8 6.8 7.0 12.6 15.3 9.3 5.8
6.3 5.9 5.7 5.3 5.4 4.9 4.7 4.7 5.0 4.9 5.6 6.3 6.6 7.6 7.7 6.8 9.6 10.5 12.5 10.1 11.3 14.8 16.8 17.3 10.1 9.0 8.8 12.7 11.0 10.9 5.9 6.2
5.0 5.8 5.2 5.4 4.8 5.6 5.8 5.3 5.4 5.0 4.6 5.1 5.4 7.2 14.2 15.1 19.0 18.8 22.1 20.0 20.5 20.0 16.9 17.0 18.6 13.3 16.6 16.2 13.1 10.3 6.2 5.5
5.5 5.7 6.1 5.4 5.4 6.1 6.0 5.7 4.6 4.3 4.4 4.7 7.3 10.2 13.5 11.9 20.3 24.7 22.9 19.6 15.3 12.7 11.3 15.3 21.4 14.2 17.9 13.6 4.9 6.1 4.4
4.9 5.8 5.5 6.0 5.6 5.3 4.9 4.8 4.3 4.5 4.1 4.0 4.3 4.5 5.3 5.7 5.0 4.9 4.1 7.8 5.1 4.1 5.5 6.7 15.4 12.8 4.4
4.9 4.4 4.5 5.7 5.8 4.6 5.1 4.8 4.0 5.2 3.8 3.7 3.6 4.0 4.2 4.2 3.7 4.2 4.2 3.6 2.9 4.1 3.9 5.2 4.2 3.6
4.2 4.2 4.1 4.3 4.7 5.3 5.2 6.0 4.0 5.4 5.4 4.1 4.2 4.3 3.9 6.9 8.3 8.7 7.5 6.0 4.1 5.0 3.5 5.7 4.2 4.1 5.0 4.3 3.6 4.2
4.0 4.3 3.9 3.8 3.9 4.4 4.1 4.5 4.3 4.2 5.0 5.3 4.4 4.5 4.9 3.9 8.2 9.7 8.6 9.7 5.9 7.9 8.4 4.4 4.8 6.5 6.4 10.3 10.0 4.3
5.0 4.4 4.7 4.4 4.2 4.4 4.5 4.5 5.4 4.9 5.9 5.4 5.1 5.6 7.0 6.6 12.1 10.7 8.3 8.6 9.2 8.1 7.1 6.8 8.8 9.2 11.7 16.4 13.2 14.2 4.2 4.8
5.3 5.1 4.8 5.1 4.5 4.6 4.6 5.0 4.7 4.5 5.9 4.9 5.1 4.7 6.7 11.6 11.4 11.5 10.3 9.8 10.4 10.2 9.5 8.6 9.7 10.4 10.3 10.1 9.9 5.2
10.0 10.2 10.2 8.5 9.0 11.2 10.1 11.8 10.2 9.7 9.9 10.3 9.2 10.3

Figure 20. SATOB 101 - 400 hPa mean daily count. FEBRUARY 2004
Global average number of observations in 24 hours = 211885

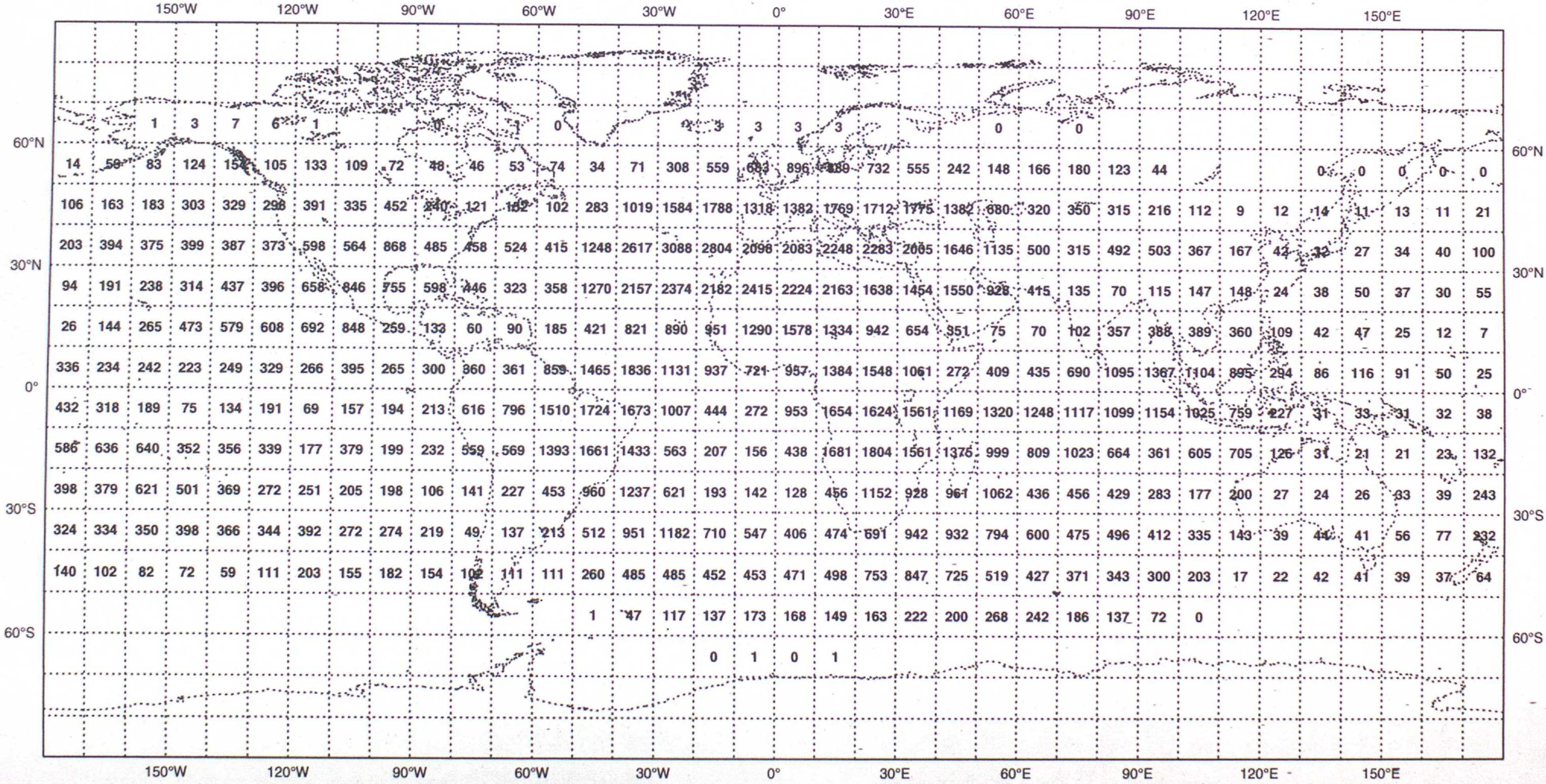

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 3 7 6 1 0 1 0 3 3 3 3 0 0
14 58 83 124 154 105 133 109 72 48 46 53 74 34 71 308 559 683 896 489 732 555 242 148 166 180 123 44 0 0 0 0 0
106 163 183 303 329 298 391 335 452 240 121 182 102 283 1019 1584 1788 1318 1382 1769 1712 1775 1382 680 320 350 315 216 112 9 12 14 11 13 11 21
203 394 375 399 387 373 598 564 868 485 458 524 415 1248 2617 3088 2804 2098 2083 2248 2283 2005 1646 1135 500 315 492 503 367 167 42 32 27 34 40 100
94 191 238 314 437 396 658 846 755 598 446 323 358 1270 2157 2374 2182 2415 2224 2163 1638 1454 1550 928 415 135 70 115 147 148 24 38 50 37 30 55
26 144 265 473 579 608 692 848 259 133 60 90 185 421 821 890 951 1290 1578 1334 942 654 351 75 70 102 357 388 389 360 109 42 47 25 12 7
336 234 242 223 249 329 266 395 265 300 360 361 859 1465 1836 1131 937 721 957 1384 1548 1061 272 409 435 690 1095 1367 1104 895 294 86 116 91 50 25
432 318 189 75 134 191 69 157 194 213 616 796 1510 1724 1673 1007 444 272 953 1654 1624 1561 1169 1320 1248 1117 1099 1154 1025 759 227 31 33 31 32 38
586 636 640 352 356 339 177 379 199 232 559 569 1393 1661 1433 563 207 156 438 1681 1804 1561 1375 999 809 1023 664 361 605 705 126 31 21 21 23 132
398 379 621 501 369 272 251 205 198 106 141 227 453 960 1237 621 193 142 128 456 1152 928 961 1062 436 456 429 283 177 200 27 24 26 33 39 243
324 334 350 398 366 344 392 272 274 219 49 137 213 512 951 1182 710 547 406 474 691 942 932 794 600 475 496 412 335 143 39 44 41 56 77 232
140 102 82 72 59 111 203 155 182 154 102 111 111 260 485 485 452 453 471 498 753 847 725 519 427 371 343 300 203 17 22 42 41 39 37 64
1 47 117 137 173 168 149 163 222 200 268 242 186 137 72 0
0 1 0 1

Figure 21. SATOB 101 - 400 hPa vector mean wind. FEBRUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

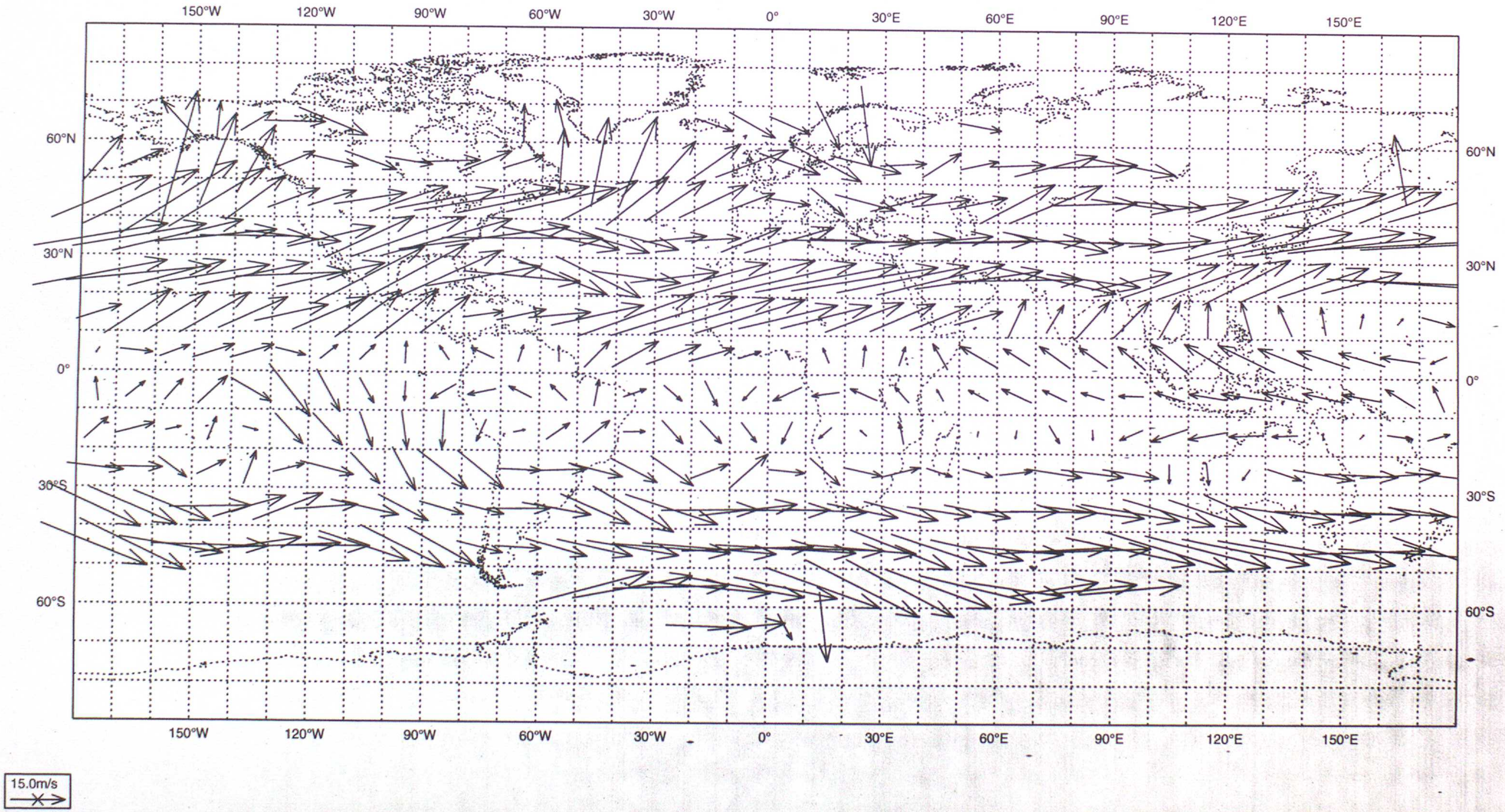

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa mean vector wind differences. FEBRUARY 2004
All observations
Arrows are plotted where greater than 10 obs are present

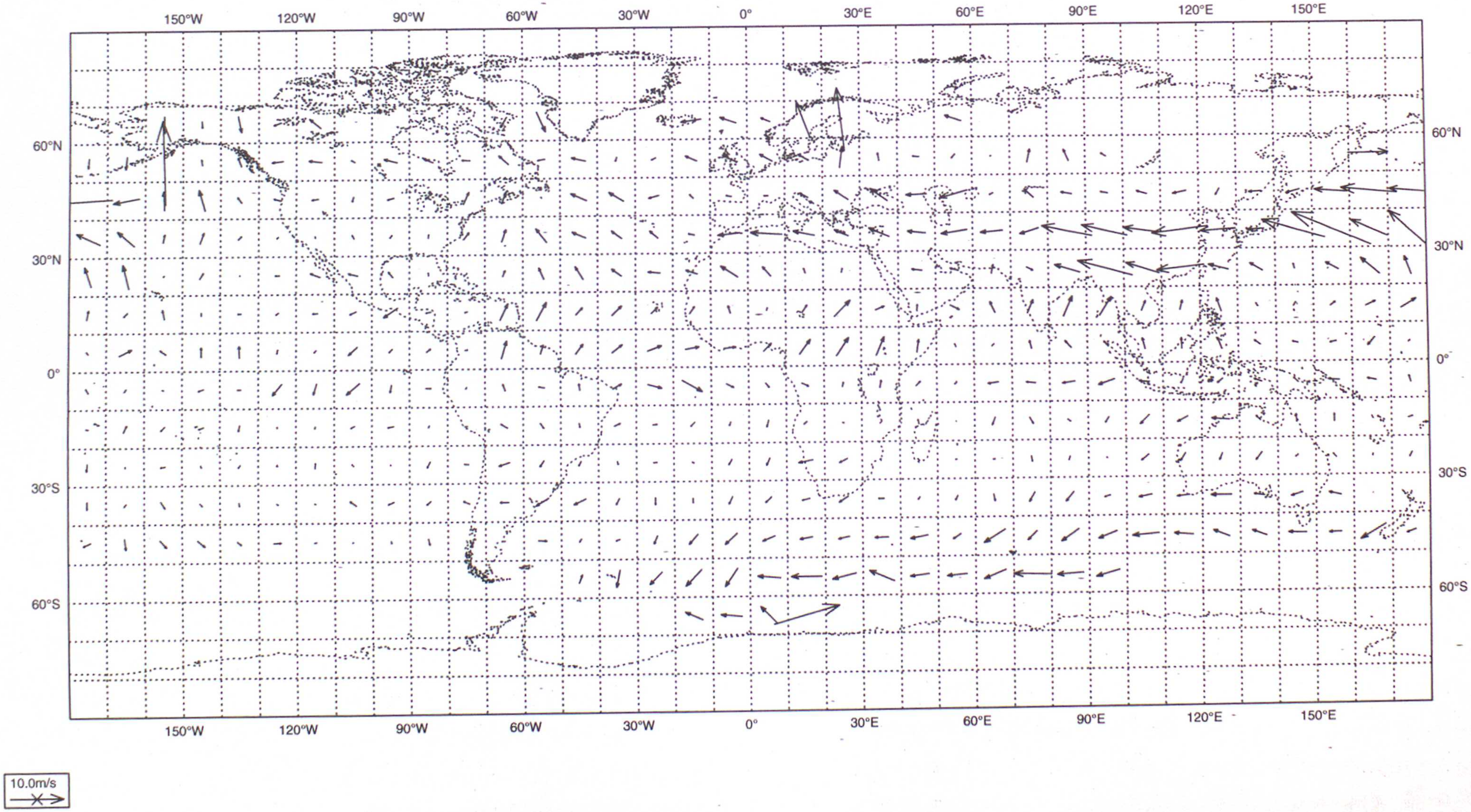

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). FEBRUARY 2004
All observations
Values are plotted where greater than 10 obs are present

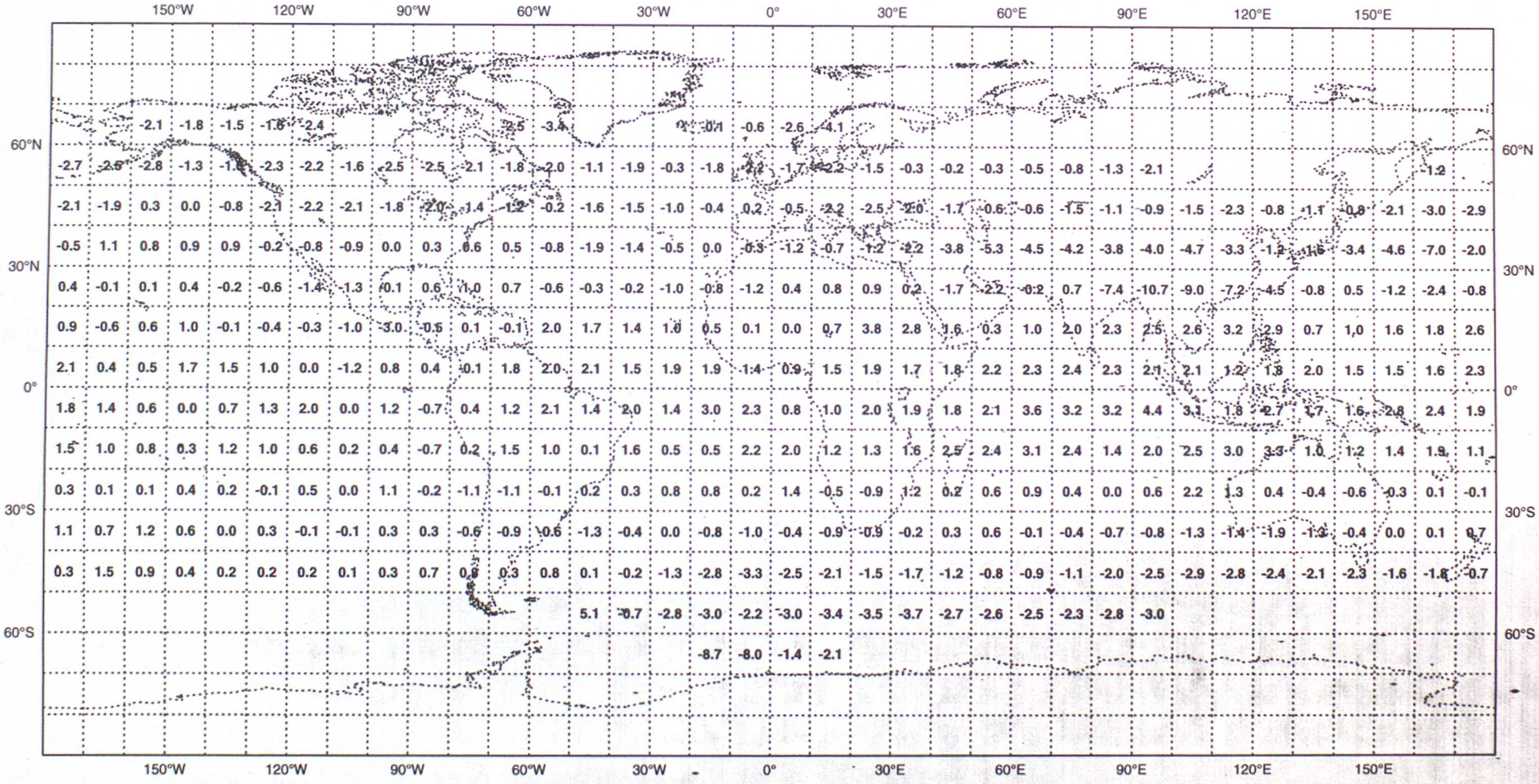
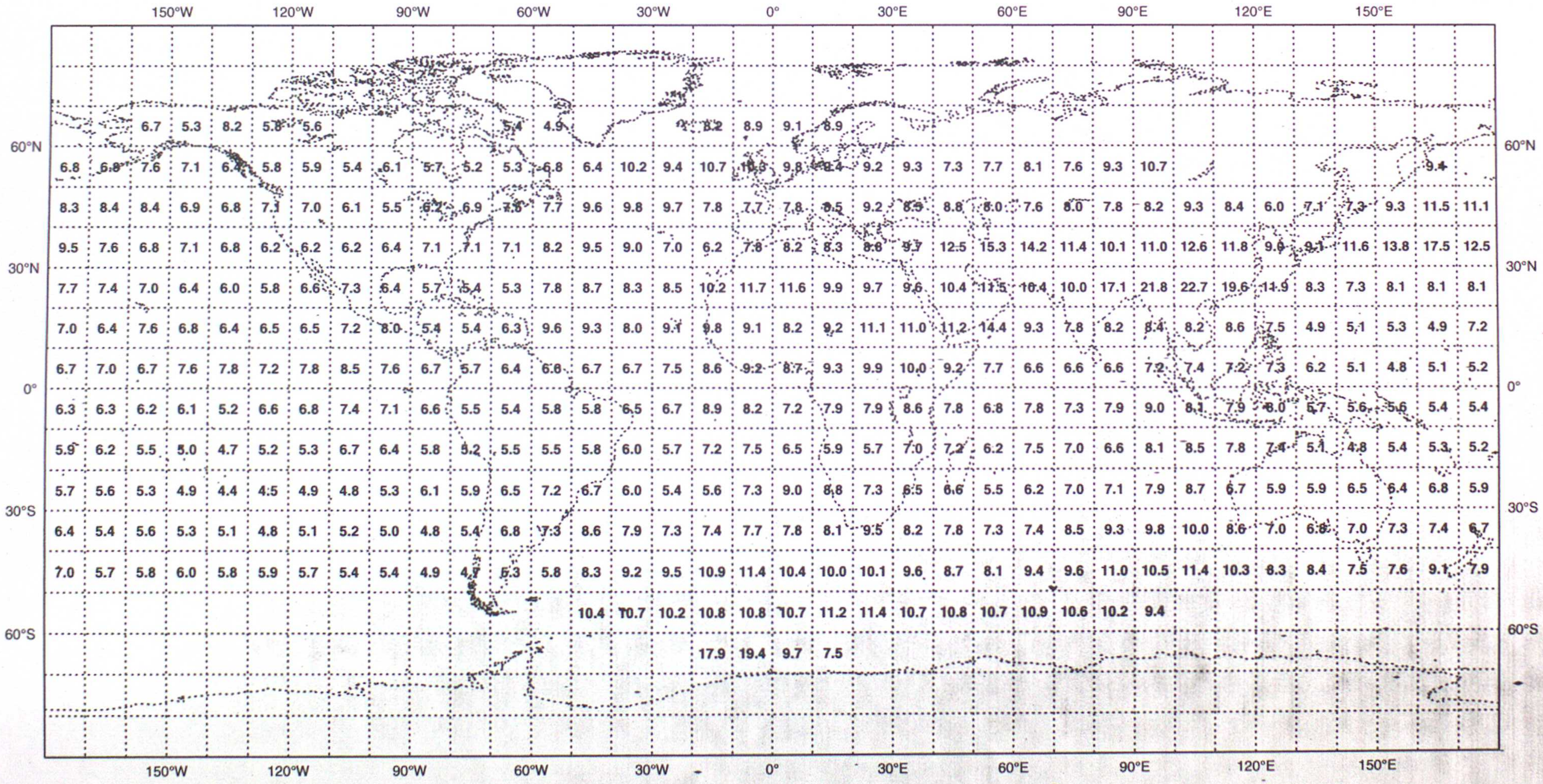

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-2.1 -1.8 -1.5 -1.6 -2.4 -2.5 -3.4 -0.1 -0.6 -2.6 -4.1
-2.7 -2.6 -2.8 -1.3 -1.8 -2.3 -2.2 -1.6 -2.5 -2.5 -2.1 -1.8 -2.0 -1.1 -1.9 -0.3 -1.8 -2.2 -1.7 -2.2 -1.5 -0.3 -0.2 -0.3 -0.5 -0.8 -1.3 -2.1 -1.2
-2.1 -1.9 0.3 0.0 -0.8 -2.1 -2.2 -2.1 -1.8 -2.0 -1.4 -1.2 -0.2 -1.6 -1.5 -1.0 -0.4 0.2 -0.5 -2.2 -2.5 -2.0 -1.7 -0.6 -0.6 -1.5 -1.1 -0.9 -1.5 -2.3 -0.8 -1.1 -0.8 -2.1 -3.0 -2.9
-0.5 1.1 0.8 0.9 0.9 -0.2 -0.8 -0.9 0.0 0.3 0.6 0.5 -0.8 -1.9 -1.4 -0.5 0.0 -0.3 -1.2 -0.7 -1.2 -2.2 -3.8 -5.3 -4.5 -4.2 -3.8 -4.0 -4.7 -3.3 -1.2 -1.6 -3.4 -4.6 -7.0 -2.0
0.4 -0.1 0.1 0.4 -0.2 -0.6 -1.4 -1.3 -0.1 0.6 1.0 0.7 -0.6 -0.3 -0.2 -1.0 -0.8 -1.2 0.4 0.8 0.9 0.2 -1.7 -2.2 -0.2 0.7 -7.4 -10.7 -9.0 -7.2 -4.5 -0.8 0.5 -1.2 -2.4 -0.8
0.9 -0.6 0.6 1.0 -0.1 -0.4 -0.3 -1.0 -3.0 -0.5 0.1 -0.1 2.0 1.7 1.4 1.0 0.5 0.1 0.0 0.7 3.8 2.8 1.6 0.3 1.0 2.0 2.3 2.5 2.6 3.2 2.9 0.7 1.0 1.6 1.8 2.6
2.1 0.4 0.5 1.7 1.5 1.0 0.0 -1.2 0.8 0.4 -0.1 1.8 2.0 2.1 1.5 1.9 1.9 -1.4 0.9 1.5 1.9 1.7 1.8 2.2 2.3 2.4 2.3 2.1 2.1 1.2 1.8 2.0 1.5 1.5 1.6 2.3
1.8 1.4 0.6 0.0 0.7 1.3 2.0 0.0 1.2 -0.7 0.4 1.2 2.1 1.4 2.0 1.4 3.0 2.3 0.8 1.0 2.0 1.9 1.8 2.1 3.6 3.2 3.2 4.4 3.1 1.8 2.7 1.7 1.6 2.8 2.4 1.9
1.5 1.0 0.8 0.3 1.2 1.0 0.6 0.2 0.4 -0.7 0.2 1.5 1.0 0.1 1.6 0.5 0.5 2.2 2.0 1.2 1.3 1.6 2.5 2.4 3.1 2.4 1.4 2.0 2.5 3.0 3.3 1.0 1.2 1.4 1.9 1.1
0.3 0.1 0.1 0.4 0.2 -0.1 0.5 0.0 1.1 -0.2 -1.1 -1.1 -0.1 0.2 0.3 0.8 0.8 0.2 1.4 -0.5 -0.9 1.2 0.2 0.6 0.9 0.4 0.0 0.6 2.2 1.3 0.4 -0.4 -0.6 -0.3 0.1 -0.1
1.1 0.7 1.2 0.6 0.0 0.3 -0.1 -0.1 0.3 0.3 -0.6 -0.9 0.6 -1.3 -0.4 0.0 -0.8 -1.0 -0.4 -0.9 -0.9 -0.2 0.3 0.6 -0.1 -0.4 -0.7 -0.8 -1.3 -1.4 -1.9 -1.3 -0.4 0.0 0.1 0.7
0.3 1.5 0.9 0.4 0.2 0.2 0.2 0.1 0.3 0.7 0.8 0.3 0.8 0.1 -0.2 -1.3 -2.8 -3.3 -2.5 -2.1 -1.5 -1.7 -1.2 -0.8 -0.9 -1.1 -2.0 -2.5 -2.9 -2.8 -2.4 -2.1 -2.3 -1.6 -1.8 -0.7
5.1 -0.7 -2.8 -3.0 -2.2 -3.0 -3.4 -3.5 -3.7 -2.7 -2.6 -2.5 -2.3 -2.8 -3.0
-8.7 -8.0 -1.4 -2.1

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). FEBRUARY 2004
All observations
Values are plotted where greater than 10 obs are present


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
6.7 5.3 8.2 5.8 5.6 5.4 4.9 8.2 8.9 9.1 8.9
6.8 6.8 7.6 7.1 6.4 5.8 5.9 5.4 6.1 5.7 5.2 5.3 6.8 6.4 10.2 9.4 10.7 10.3 9.8 8.4 9.2 9.3 7.3 7.7 8.1 7.6 9.3 10.7 9.4
8.3 8.4 8.4 6.9 6.8 7.1 7.0 6.1 5.5 6.2 6.9 7.5 7.7 9.6 9.8 9.7 7.8 7.7 7.8 8.5 9.2 8.5 8.8 8.0 7.6 8.0 7.8 8.2 9.3 8.4 6.0 7.1 7.3 9.3 11.5 11.1
9.5 7.6 6.8 7.1 6.8 6.2 6.2 6.2 6.4 7.1 7.1 7.1 8.2 9.5 9.0 7.0 6.2 7.8 8.2 8.3 8.6 9.7 12.5 15.3 14.2 11.4 10.1 11.0 12.6 11.8 9.0 9.1 11.6 13.8 17.5 12.5
7.7 7.4 7.0 6.4 6.0 5.8 6.6 7.3 6.4 5.7 5.4 5.3 7.8 8.7 8.3 8.5 10.2 11.7 11.6 9.9 9.7 9.6 10.4 11.5 10.4 10.0 17.1 21.8 22.7 19.6 14.9 8.3 7.3 8.1 8.1 8.1
7.0 6.4 7.6 6.8 6.4 6.5 6.5 7.2 8.0 5.4 5.4 6.3 9.6 9.3 8.0 9.1 9.8 9.1 8.2 9.2 11.1 11.0 11.2 14.4 9.3 7.8 8.2 8.4 8.2 8.6 7.5 4.9 5.1 5.3 4.9 7.2
6.7 7.0 6.7 7.6 7.8 7.2 7.8 8.5 7.6 6.7 5.7 6.4 6.8 6.7 6.7 7.5 8.6 9.2 8.7 9.3 9.9 10.0 9.2 7.7 6.6 6.6 6.6 7.2 7.4 7.2 7.3 6.2 5.1 4.8 5.1 5.2
6.3 6.3 6.2 6.1 5.2 6.6 6.8 7.4 7.1 6.6 5.5 5.4 5.8 5.8 6.5 6.7 8.9 8.2 7.2 7.9 7.9 8.6 7.8 6.8 7.8 7.3 7.9 9.0 8.1 7.9 8.0 5.7 5.6 5.6 5.4 5.4
5.9 6.2 5.5 5.0 4.7 5.2 5.3 6.7 6.4 5.8 5.2 5.5 5.5 5.8 6.0 5.7 7.2 7.5 6.5 5.9 5.7 7.0 7.2 6.2 7.5 7.0 6.6 8.1 8.5 7.8 7.4 5.1 4.8 5.4 5.3 5.2
5.7 5.6 5.3 4.9 4.4 4.5 4.9 4.8 5.3 6.1 5.9 6.5 7.2 6.7 6.0 5.4 5.6 7.3 9.0 8.8 7.3 6.5 6.6 5.5 6.2 7.0 7.1 7.9 8.7 6.7 5.9 5.9 6.5 6.4 6.8 5.9
6.4 5.4 5.6 5.3 5.1 4.8 5.1 5.2 5.0 4.8 5.4 6.8 7.3 8.6 7.9 7.3 7.4 7.7 7.8 8.1 9.5 8.2 7.8 7.3 7.4 8.5 9.3 9.8 10.0 8.6 7.0 6.8 7.0 7.3 7.4 6.7
7.0 5.7 5.8 6.0 5.8 5.9 5.7 5.4 5.4 4.9 4.7 5.3 5.8 8.3 9.2 9.5 10.9 11.4 10.4 10.0 10.1 9.6 8.7 8.1 9.4 9.6 11.0 10.5 11.4 10.3 8.3 8.4 7.5 7.6 9.1 7.9
10.4 10.7 10.2 10.8 10.8 10.7 11.2 11.4 10.7 10.8 10.7 10.9 10.6 10.2 9.4
17.9 19.4 9.7 7.5

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: EXETER

MONTH: Feb 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15, NOAA-16 and NOAA-17.

Standard of comparison :Background field from UKMO global model.

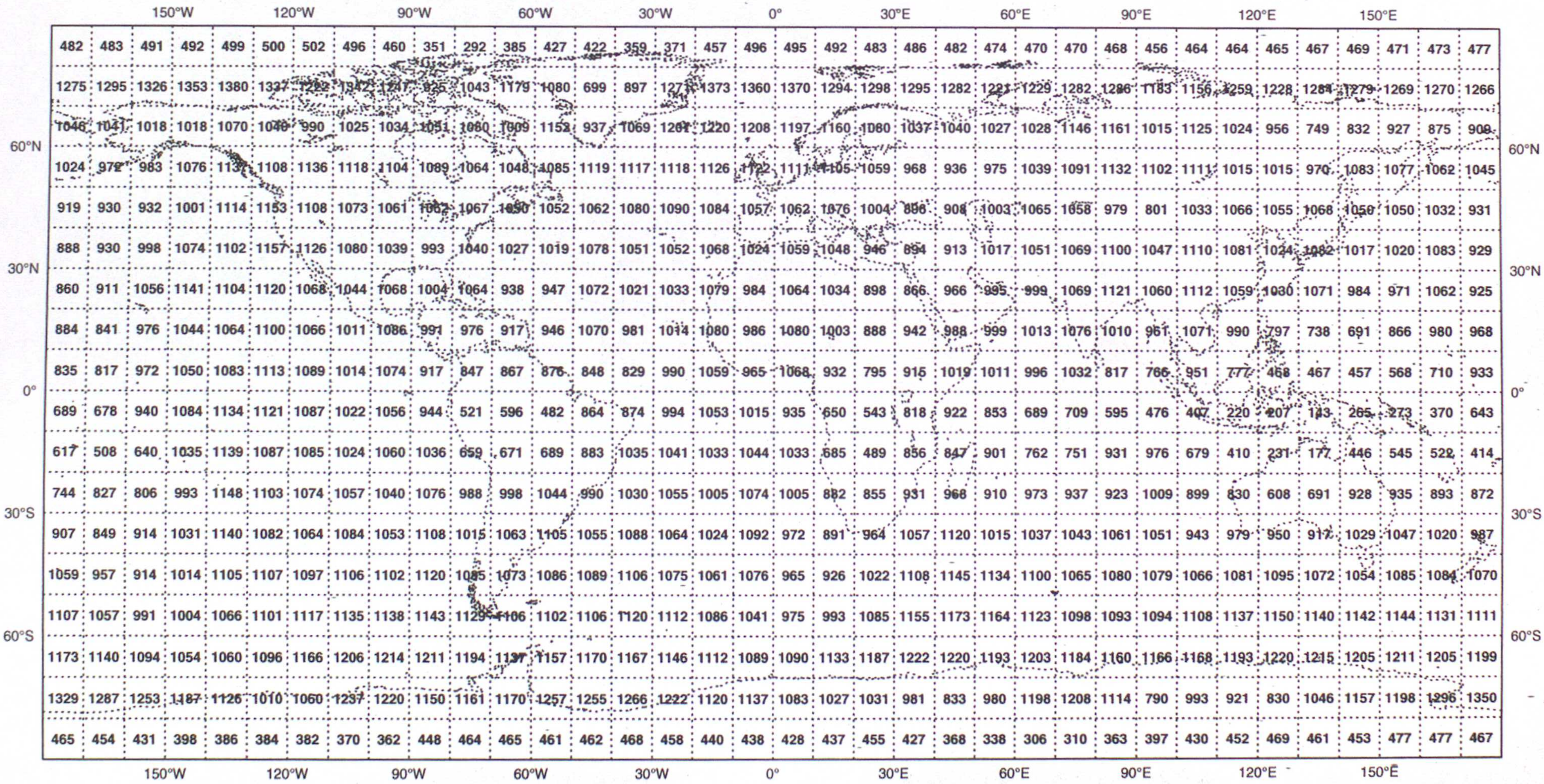
Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

- HIRS8 (Surface)
- HIRS15 (700)
- HIRS11 (500-700)
- HIRS4 (400)
- AMSUA5 (700)
- AMSUA7 (300)
- AMSUA9 (100)

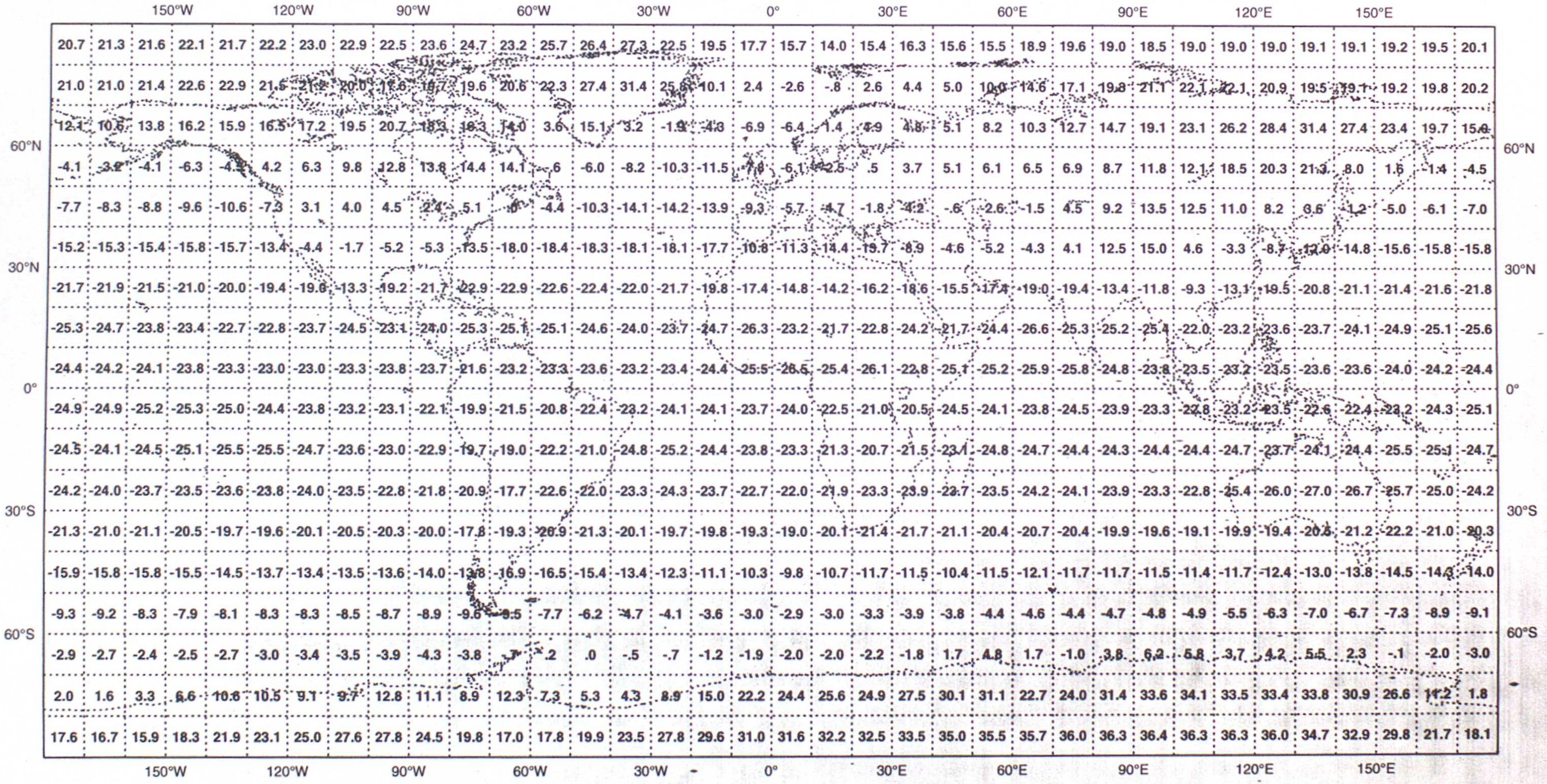
:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. FEBRUARY 2004
NOAA15, using all observations
Global average number of observations in 24 hours = 615419



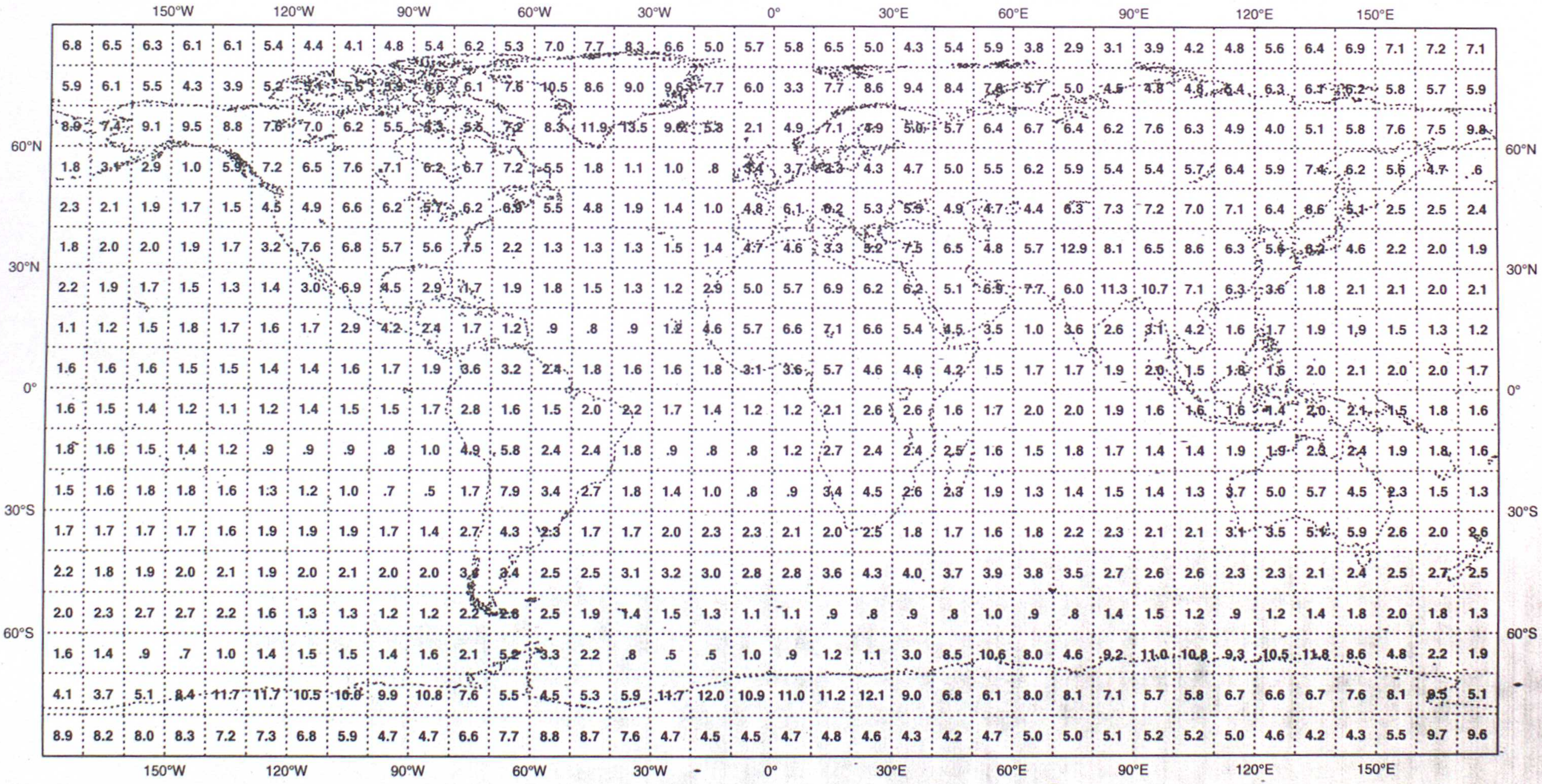
482	483	491	492	499	500	502	496	460	351	292	385	427	422	359	371	457	496	495	492	483	486	482	474	470	470	468	456	464	464	465	467	469	471	473	477
1275	1295	1326	1353	1380	1337	1222	1342	1247	925	1043	1179	1080	699	897	1271	1373	1360	1370	1294	1298	1295	1282	1221	1229	1282	1286	1183	1156	1259	1228	1284	1279	1269	1270	1266
1046	1041	1018	1018	1070	1040	990	1025	1034	1051	1080	1009	1152	937	1069	1201	1220	1208	1197	1160	1080	1037	1040	1027	1028	1146	1161	1015	1125	1024	956	749	832	927	875	908
1024	972	983	1076	1137	1108	1136	1118	1104	1089	1064	1048	1085	1119	1117	1118	1126	1122	1111	1105	1059	968	936	975	1039	1091	1132	1102	1111	1015	1015	970	1083	1077	1062	1045
919	930	932	1001	1114	1153	1108	1073	1061	1062	1067	1050	1052	1062	1080	1090	1084	1057	1062	1076	1004	896	908	1003	1065	1058	979	801	1033	1066	1055	1068	1050	1050	1032	931
888	930	998	1074	1102	1157	1126	1080	1039	993	1040	1027	1019	1078	1051	1052	1068	1024	1059	1048	946	894	913	1017	1051	1069	1100	1047	1110	1081	1024	1082	1017	1020	1083	929
860	911	1056	1141	1104	1120	1068	1044	1068	1004	1064	938	947	1072	1021	1033	1079	984	1064	1034	898	866	966	995	999	1069	1121	1060	1112	1059	1030	1071	984	971	1062	925
884	841	976	1044	1064	1100	1066	1011	1086	991	976	917	946	1070	981	1014	1080	986	1080	1003	888	942	988	999	1013	1076	1010	961	1071	990	797	738	691	866	980	968
835	817	972	1050	1083	1113	1089	1014	1074	917	847	867	876	848	829	990	1059	965	1068	932	795	915	1019	1011	996	1032	817	766	951	777	468	467	457	568	710	933
689	678	940	1084	1134	1121	1087	1022	1056	944	521	596	482	864	874	994	1053	1015	935	650	543	818	922	853	689	709	595	476	407	220	207	143	265	273	370	643
617	508	640	1035	1139	1087	1085	1024	1060	1036	659	671	689	883	1035	1041	1033	1044	1033	685	489	856	847	901	762	751	931	976	679	410	231	177	446	545	522	414
744	827	806	993	1148	1103	1074	1057	1040	1076	988	998	1044	990	1030	1055	1005	1074	1005	882	855	931	968	910	973	937	923	1009	899	830	608	691	928	935	893	872
907	849	914	1031	1140	1082	1064	1084	1053	1108	1015	1063	1105	1055	1088	1064	1024	1092	972	891	964	1057	1120	1015	1037	1043	1061	1051	943	979	950	917	1029	1047	1020	987
1059	957	914	1014	1105	1107	1097	1106	1102	1120	1085	1073	1086	1089	1106	1075	1061	1076	965	926	1022	1108	1145	1134	1100	1065	1080	1079	1066	1081	1095	1072	1054	1085	1084	1070
1107	1057	991	1004	1066	1101	1117	1135	1138	1143	1129	1106	1102	1106	1120	1112	1086	1041	975	993	1085	1155	1173	1164	1123	1098	1093	1094	1108	1137	1150	1140	1142	1144	1131	1111
1173	1140	1094	1054	1060	1096	1166	1206	1214	1211	1194	1137	1157	1170	1167	1146	1112	1089	1090	1133	1187	1222	1220	1193	1203	1184	1160	1166	1168	1193	1220	1215	1205	1211	1205	1199
1329	1287	1253	1187	1126	1010	1060	1237	1220	1150	1161	1170	1257	1255	1266	1222	1120	1137	1083	1027	1031	981	833	980	1198	1208	1114	790	993	921	830	1046	1157	1198	1296	1350
465	454	431	398	386	384	382	370	362	448	464	465	461	462	468	458	440	438	428	437	455	427	368	338	306	310	363	397	430	452	469	461	453	477	477	467

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations



20.7	21.3	21.6	22.1	21.7	22.2	23.0	22.9	22.5	23.6	24.7	23.2	25.7	26.4	27.3	22.5	19.5	17.7	15.7	14.0	15.4	16.3	15.6	15.5	18.9	19.6	19.0	18.5	19.0	19.0	19.0	19.1	19.1	19.2	19.5	20.1
21.0	21.0	21.4	22.6	22.9	21.6	21.2	20.0	17.6	18.7	19.6	20.6	22.3	27.4	31.4	25.6	10.1	2.4	-2.6	-.8	2.6	4.4	5.0	10.0	14.6	17.1	19.8	21.1	22.1	22.1	20.9	19.5	19.1	19.2	19.8	20.2
12.1	10.6	13.8	16.2	15.9	16.5	17.2	19.5	20.7	18.3	16.3	14.0	3.6	15.1	3.2	-1.9	-4.3	-6.9	-6.4	1.4	4.9	4.8	5.1	8.2	10.3	12.7	14.7	19.1	23.1	26.2	28.4	31.4	27.4	23.4	19.7	15.6
-4.1	-3.2	-4.1	-6.3	-4.2	4.2	6.3	9.8	12.8	13.8	14.4	14.1	-.6	-6.0	-8.2	-10.3	-11.5	-7.8	-6.1	-2.5	.5	3.7	5.1	6.1	6.5	6.9	8.7	11.8	12.1	18.5	20.3	21.3	8.0	1.6	-1.4	-4.5
-7.7	-8.3	-8.8	-9.6	-10.6	-7.3	3.1	4.0	4.5	2.4	5.1	-.6	-4.4	-10.3	-14.1	-14.2	-13.9	-9.3	-5.7	-4.7	-1.8	-4.2	-.6	-2.6	-1.5	4.5	9.2	13.5	12.5	11.0	8.2	3.6	-1.2	-5.0	-6.1	-7.0
-15.2	-15.3	-15.4	-15.8	-15.7	-13.4	-4.4	-1.7	-5.2	-5.3	-13.5	-18.0	-18.4	-18.3	-18.1	-18.1	-17.7	-10.8	-11.3	-14.4	-19.7	-8.9	-4.6	-5.2	-4.3	4.1	12.5	15.0	4.6	-3.3	-8.7	-12.0	-14.8	-15.6	-15.8	-15.8
-21.7	-21.9	-21.5	-21.0	-20.0	-19.4	-19.6	-13.3	-19.2	-21.7	-22.9	-22.9	-22.6	-22.4	-22.0	-21.7	-19.8	-17.4	-14.8	-14.2	-16.2	-18.6	-15.5	-17.4	-19.0	-19.4	-13.4	-11.8	-9.3	-13.1	-19.5	-20.8	-21.1	-21.4	-21.6	-21.8
-25.3	-24.7	-23.8	-23.4	-22.7	-22.8	-23.7	-24.5	-23.1	-24.0	-25.3	-25.1	-25.1	-24.6	-24.0	-23.7	-24.7	-26.3	-23.2	-21.7	-22.8	-24.2	-21.7	-24.4	-26.6	-25.3	-25.2	-25.4	-22.0	-23.2	-23.6	-23.7	-24.1	-24.9	-25.1	-25.6
-24.4	-24.2	-24.1	-23.8	-23.3	-23.0	-23.0	-23.3	-23.8	-23.7	-21.6	-23.2	-23.3	-23.6	-23.2	-23.4	-24.4	-25.5	-26.5	-25.4	-26.1	-22.8	-25.1	-25.2	-25.9	-25.8	-24.8	-23.8	-23.5	-23.2	-23.5	-23.6	-23.6	-24.0	-24.2	-24.4
-24.9	-24.9	-25.2	-25.3	-25.0	-24.4	-23.8	-23.2	-23.1	-22.1	-19.9	-21.5	-20.8	-22.4	-23.2	-24.1	-24.1	-23.7	-24.0	-22.5	-21.0	-20.5	-24.5	-24.1	-23.8	-24.5	-23.9	-23.3	-22.8	-23.2	-23.5	-22.6	-22.4	-23.2	-24.3	-25.1
-24.5	-24.1	-24.5	-25.1	-25.5	-25.5	-24.7	-23.6	-23.0	-22.9	-19.7	-19.0	-22.2	-21.0	-24.8	-25.2	-24.4	-23.8	-23.3	-21.3	-20.7	-21.5	-23.1	-24.8	-24.7	-24.4	-24.3	-24.4	-24.4	-24.7	-23.7	-24.1	-24.4	-25.5	-25.1	-24.7
-24.2	-24.0	-23.7	-23.5	-23.6	-23.8	-24.0	-23.5	-22.8	-21.8	-20.9	-17.7	-22.6	-22.0	-23.3	-24.3	-23.7	-22.7	-22.0	-21.9	-23.3	-23.9	-23.7	-23.5	-24.2	-24.1	-23.9	-23.3	-22.8	-25.4	-26.0	-27.0	-26.7	-25.7	-25.0	-24.2
-21.3	-21.0	-21.1	-20.5	-19.7	-19.6	-20.1	-20.5	-20.3	-20.0	-17.8	-19.3	-20.9	-21.3	-20.1	-19.7	-19.8	-19.3	-19.0	-20.1	-21.4	-21.7	-21.1	-20.4	-20.7	-20.4	-19.9	-19.6	-19.1	-19.9	-19.4	-20.6	-21.2	-22.2	-21.0	-20.3
-15.9	-15.8	-15.8	-15.5	-14.5	-13.7	-13.4	-13.5	-13.6	-14.0	-13.8	-16.9	-16.5	-15.4	-13.4	-12.3	-11.1	-10.3	-9.8	-10.7	-11.7	-11.5	-10.4	-11.5	-12.1	-11.7	-11.7	-11.5	-11.4	-11.7	-12.4	-13.0	-13.8	-14.5	-14.3	-14.0
-9.3	-9.2	-8.3	-7.9	-8.1	-8.3	-8.3	-8.5	-8.7	-8.9	-9.6	-9.5	-7.7	-6.2	-4.7	-4.1	-3.6	-3.0	-2.9	-3.0	-3.3	-3.9	-3.8	-4.4	-4.6	-4.4	-4.7	-4.8	-4.9	-5.5	-6.3	-7.0	-6.7	-7.3	-8.9	-9.1
-2.9	-2.7	-2.4	-2.5	-2.7	-3.0	-3.4	-3.5	-3.9	-4.3	-3.8	-.7	.2	.0	-.5	-.7	-1.2	-1.9	-2.0	-2.0	-2.2	-1.8	1.7	4.8	1.7	-1.0	3.8	6.2	5.8	3.7	4.2	5.5	2.3	-.1	-2.0	-3.0
2.0	1.6	3.3	6.6	10.6	10.5	9.1	9.7	12.8	11.1	8.9	12.3	7.3	5.3	4.3	8.9	15.0	22.2	24.4	25.6	24.9	27.5	30.1	31.1	22.7	24.0	31.4	33.6	34.1	33.5	33.4	33.8	30.9	26.6	11.2	1.8
17.6	16.7	15.9	18.3	21.9	23.1	25.0	27.6	27.8	24.5	19.8	17.0	17.8	19.9	23.5	27.8	29.6	31.0	31.6	32.2	32.5	33.5	35.0	35.5	35.7	36.0	36.3	36.4	36.3	36.3	36.0	34.7	32.9	29.8	21.7	18.1

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations



6.8	6.5	6.3	6.1	6.1	5.4	4.4	4.1	4.8	5.4	6.2	5.3	7.0	7.7	8.3	6.6	5.0	5.7	5.8	6.5	5.0	4.3	5.4	5.9	3.8	2.9	3.1	3.9	4.2	4.8	5.6	6.4	6.9	7.1	7.2	7.1
5.9	6.1	5.5	4.3	3.9	5.2	5.1	5.5	5.9	6.0	6.1	7.6	10.5	8.6	9.0	9.6	7.7	6.0	3.3	7.7	8.6	9.4	8.4	7.8	5.7	5.0	4.5	4.8	4.8	6.4	6.3	6.1	6.2	5.8	5.7	5.9
8.9	7.4	9.1	9.5	8.8	7.6	7.0	6.2	5.5	5.3	5.6	7.2	8.3	11.9	13.5	9.6	5.8	2.1	4.9	7.1	4.9	5.0	5.7	6.4	6.7	6.4	6.2	7.6	6.3	4.9	4.0	5.1	5.8	7.6	7.5	9.8
1.8	3.1	2.9	1.0	5.9	7.2	6.5	7.6	7.1	6.2	6.7	7.2	5.5	1.8	1.1	1.0	.8	3.4	3.7	2.3	4.3	4.7	5.0	5.5	6.2	5.9	5.4	5.4	5.7	6.4	5.9	7.4	6.2	5.6	4.7	.6
2.3	2.1	1.9	1.7	1.5	4.5	4.9	6.6	6.2	5.7	6.2	6.9	5.5	4.8	1.9	1.4	1.0	4.8	6.1	6.2	5.3	5.5	4.9	4.7	4.4	6.3	7.3	7.2	7.0	7.1	6.4	8.6	5.1	2.5	2.5	2.4
1.8	2.0	2.0	1.9	1.7	3.2	7.6	6.8	5.7	5.6	7.5	2.2	1.3	1.3	1.3	1.5	1.4	4.7	4.6	3.3	5.2	7.5	6.5	4.8	5.7	12.9	8.1	6.5	8.6	6.3	5.6	6.2	4.6	2.2	2.0	1.9
2.2	1.9	1.7	1.5	1.3	1.4	3.0	6.9	4.5	2.9	1.7	1.9	1.8	1.5	1.3	1.2	2.9	5.0	5.7	6.9	6.2	6.2	5.1	6.9	7.7	6.0	11.3	10.7	7.1	6.3	3.6	1.8	2.1	2.1	2.0	2.1
1.1	1.2	1.5	1.8	1.7	1.6	1.7	2.9	4.2	2.4	1.7	1.2	.9	.8	.9	1.2	4.6	5.7	6.6	7.1	6.6	5.4	4.5	3.5	1.0	3.6	2.6	3.1	4.2	1.6	1.7	1.9	1.9	1.5	1.3	1.2
1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.6	1.7	1.9	3.6	3.2	2.4	1.8	1.6	1.6	1.8	3.1	3.6	5.7	4.6	4.6	4.2	1.5	1.7	1.7	1.9	2.0	1.5	1.8	1.6	2.0	2.1	2.0	2.0	1.7
1.6	1.5	1.4	1.2	1.1	1.2	1.4	1.5	1.5	1.7	2.8	1.6	1.5	2.0	2.2	1.7	1.4	1.2	1.2	2.1	2.6	2.6	1.6	1.7	2.0	2.0	1.9	1.6	1.6	1.6	1.4	2.0	2.1	1.5	1.8	1.6
1.8	1.6	1.5	1.4	1.2	.9	.9	.9	.8	1.0	4.9	5.8	2.4	2.4	1.8	.9	.8	.8	1.2	2.7	2.4	2.4	2.5	1.6	1.5	1.8	1.7	1.4	1.4	1.9	1.9	2.3	2.4	1.9	1.8	1.6
1.5	1.6	1.8	1.8	1.6	1.3	1.2	1.0	.7	.5	1.7	7.9	3.4	2.7	1.8	1.4	1.0	.8	.9	3.4	4.5	2.6	2.3	1.9	1.3	1.4	1.5	1.4	1.3	3.7	5.0	5.7	4.5	2.3	1.5	1.3
1.7	1.7	1.7	1.7	1.6	1.9	1.9	1.9	1.7	1.4	2.7	4.3	2.3	1.7	1.7	2.0	2.3	2.3	2.1	2.0	2.5	1.8	1.7	1.6	1.8	2.2	2.3	2.1	2.1	3.1	3.5	5.1	5.9	2.6	2.0	2.6
2.2	1.8	1.9	2.0	2.1	1.9	2.0	2.1	2.0	2.0	3.6	3.4	2.5	2.5	3.1	3.2	3.0	2.8	2.8	3.6	4.3	4.0	3.7	3.9	3.8	3.5	2.7	2.6	2.6	2.3	2.3	2.1	2.4	2.5	2.7	2.5
2.0	2.3	2.7	2.7	2.2	1.6	1.3	1.3	1.2	1.2	2.2	2.8	2.5	1.9	1.4	1.5	1.3	1.1	1.1	.9	.8	.9	.8	1.0	.9	.8	1.4	1.5	1.2	.9	1.2	1.4	1.8	2.0	1.8	1.3
1.6	1.4	.9	.7	1.0	1.4	1.5	1.5	1.4	1.6	2.1	5.2	3.3	2.2	.8	.5	.5	1.0	.9	1.2	1.1	3.0	8.5	10.6	8.0	4.6	9.2	11.0	10.8	9.3	10.5	11.8	8.6	4.8	2.2	1.9
4.1	3.7	5.1	8.4	11.7	11.7	10.5	10.0	9.9	10.8	7.6	5.5	4.5	5.3	5.9	11.7	12.0	10.9	11.0	11.2	12.1	9.0	6.8	6.1	8.0	8.1	7.1	5.7	5.8	6.7	6.6	6.7	7.6	8.1	9.5	5.1
8.9	8.2	8.0	8.3	7.2	7.3	6.8	5.9	4.7	4.7	6.6	7.7	8.8	8.7	7.6	4.7	4.5	4.5	4.7	4.8	4.6	4.3	4.2	4.7	5.0	5.0	5.1	5.2	5.2	5.0	4.6	4.2	4.3	5.5	9.7	9.6

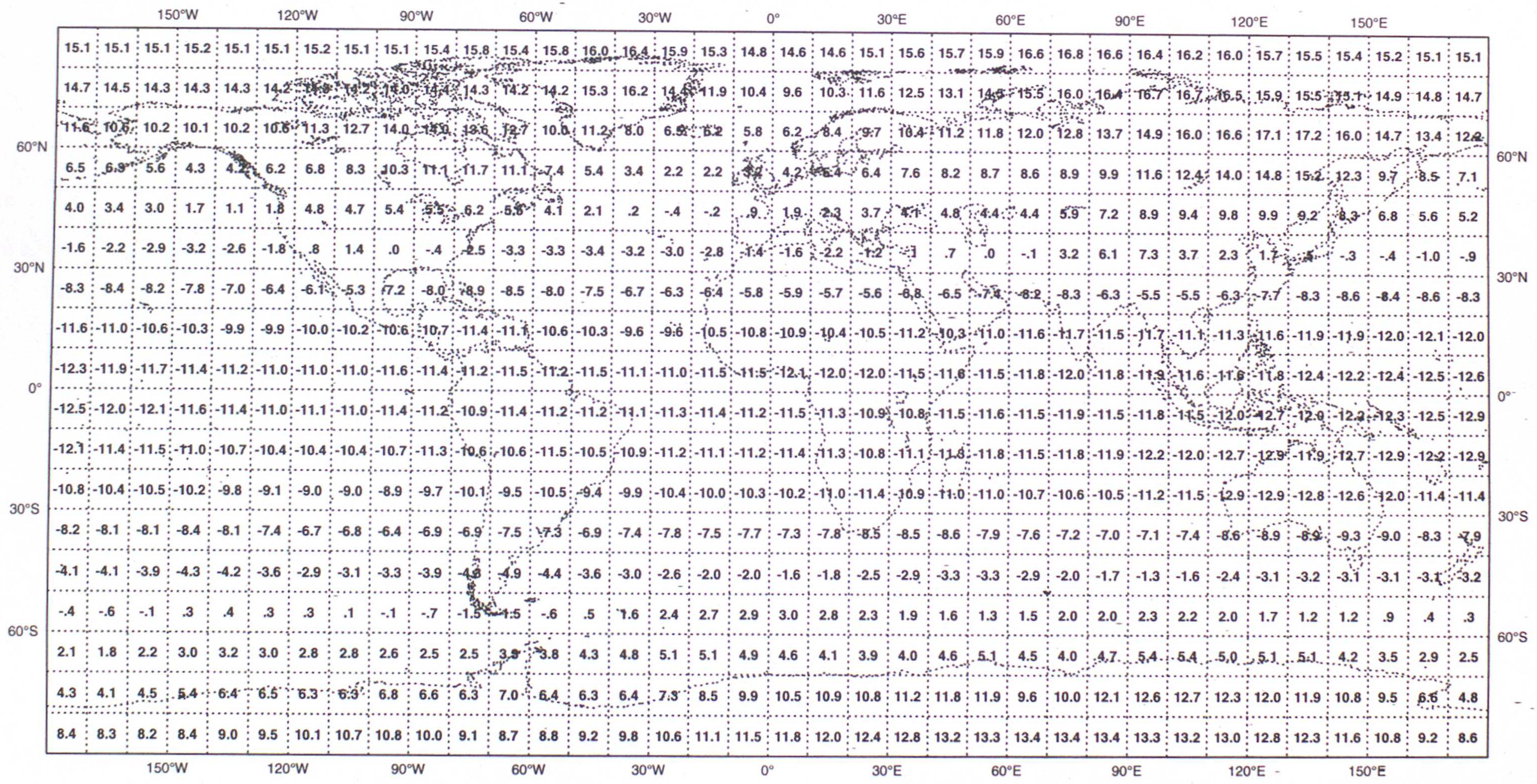
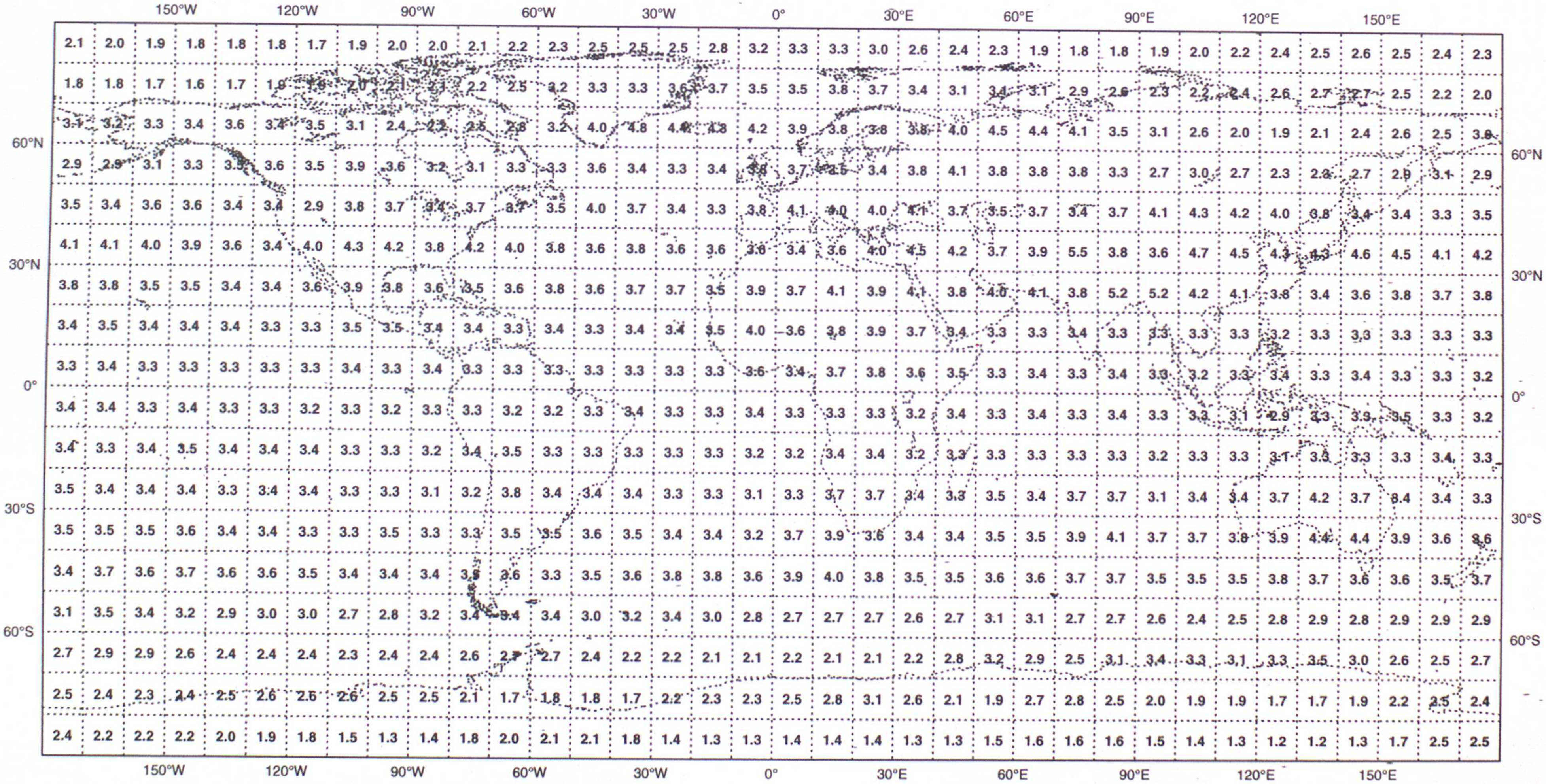


Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

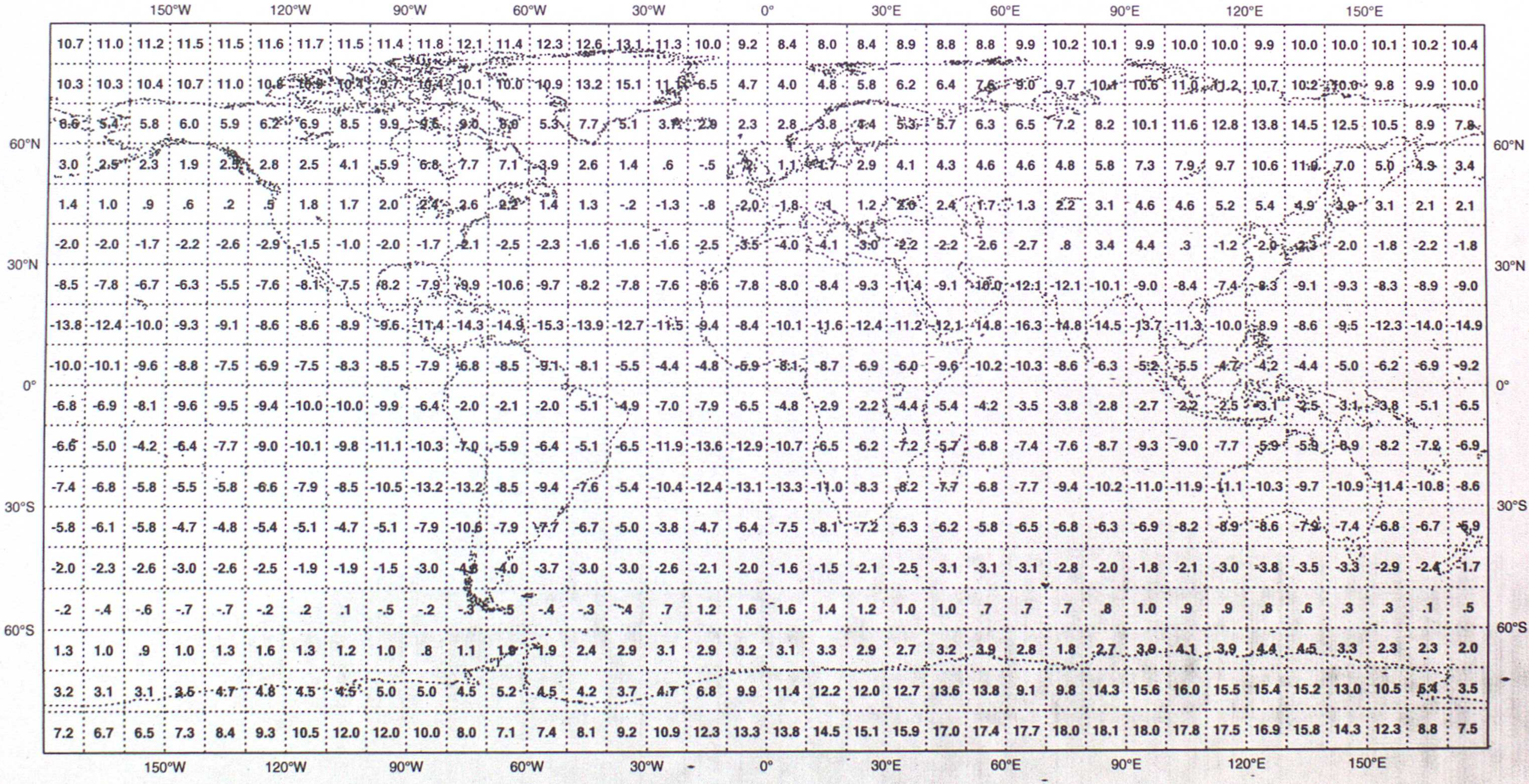
15.1	15.1	15.1	15.2	15.1	15.1	15.2	15.1	15.1	15.4	15.8	15.4	15.8	16.0	16.4	15.9	15.3	14.8	14.6	14.6	15.1	15.6	15.7	15.9	16.6	16.8	16.6	16.4	16.2	16.0	15.7	15.5	15.4	15.2	15.1	15.1
14.7	14.5	14.3	14.3	14.3	14.2	14.8	14.2	14.0	14.4	14.3	14.2	14.2	15.3	16.2	14.4	11.9	10.4	9.6	10.3	11.6	12.5	13.1	14.5	15.5	16.0	16.4	16.7	16.7	16.5	15.9	15.5	15.1	14.9	14.8	14.7
11.6	10.6	10.2	10.1	10.2	10.6	11.3	12.7	14.0	14.0	13.6	12.7	10.0	11.2	8.0	6.5	6.2	5.8	6.2	8.4	9.7	10.4	11.2	11.8	12.0	12.8	13.7	14.9	16.0	16.6	17.1	17.2	16.0	14.7	13.4	12.2
6.5	6.9	5.6	4.3	4.2	6.2	6.8	8.3	10.3	11.1	11.7	11.1	7.4	5.4	3.4	2.2	2.2	3.2	4.2	6.4	6.4	7.6	8.2	8.7	8.6	8.9	9.9	11.6	12.4	14.0	14.8	15.2	12.3	9.7	8.5	7.1
4.0	3.4	3.0	1.7	1.1	1.8	4.8	4.7	5.4	5.5	6.2	5.8	4.1	2.1	.2	-.4	-.2	.9	1.9	2.3	3.7	4.1	4.8	4.4	4.4	5.9	7.2	8.9	9.4	9.8	9.9	9.2	8.3	6.8	5.6	5.2
-1.6	-2.2	-2.9	-3.2	-2.6	-1.8	.8	1.4	.0	-.4	-2.5	-3.3	-3.3	-3.4	-3.2	-3.0	-2.8	-1.4	-1.6	-2.2	-1.2	-.1	.7	.0	-.1	3.2	6.1	7.3	3.7	2.3	1.7	.5	-.3	-.4	-1.0	-.9
-8.3	-8.4	-8.2	-7.8	-7.0	-6.4	-6.1	-5.3	-7.2	-8.0	-8.9	-8.5	-8.0	-7.5	-6.7	-6.3	-6.4	-5.8	-5.9	-5.7	-5.6	-6.8	-6.5	-7.4	-8.2	-8.3	-6.3	-5.5	-5.5	-6.3	-7.7	-8.3	-8.6	-8.4	-8.6	-8.3
-11.6	-11.0	-10.6	-10.3	-9.9	-9.9	-10.0	-10.2	-10.6	-10.7	-11.4	-11.1	-10.6	-10.3	-9.6	-9.6	-10.5	-10.8	-10.9	-10.4	-10.5	-11.2	-10.3	-11.0	-11.6	-11.7	-11.5	-11.7	-11.1	-11.3	-11.6	-11.9	-11.9	-12.0	-12.1	-12.0
-12.3	-11.9	-11.7	-11.4	-11.2	-11.0	-11.0	-11.0	-11.6	-11.4	-11.2	-11.5	-11.2	-11.5	-11.1	-11.0	-11.5	-11.5	-12.1	-12.0	-12.0	-11.5	-11.6	-11.5	-11.8	-12.0	-11.8	-11.9	-11.6	-11.6	-11.8	-12.4	-12.2	-12.4	-12.5	-12.6
-12.5	-12.0	-12.1	-11.6	-11.4	-11.0	-11.1	-11.0	-11.4	-11.2	-10.9	-11.4	-11.2	-11.2	-11.1	-11.3	-11.4	-11.2	-11.5	-11.3	-10.9	-10.8	-11.5	-11.6	-11.5	-11.9	-11.5	-11.8	-11.5	-12.0	-12.7	-12.0	-12.2	-12.3	-12.5	-12.9
-12.1	-11.4	-11.5	-11.0	-10.7	-10.4	-10.4	-10.4	-10.7	-11.3	-10.6	-10.6	-11.5	-10.5	-10.9	-11.2	-11.1	-11.2	-11.4	-11.3	-10.8	-11.1	-11.8	-11.8	-11.5	-11.8	-11.9	-12.2	-12.0	-12.7	-12.9	-11.9	-12.7	-12.9	-12.2	-12.9
-10.8	-10.4	-10.5	-10.2	-9.8	-9.1	-9.0	-9.0	-8.9	-9.7	-10.1	-9.5	-10.5	-9.4	-9.9	-10.4	-10.0	-10.3	-10.2	-11.0	-11.4	-10.9	-11.0	-11.0	-10.7	-10.6	-10.5	-11.2	-11.5	-12.9	-12.9	-12.8	-12.6	-12.0	-11.4	-11.4
-8.2	-8.1	-8.1	-8.4	-8.1	-7.4	-6.7	-6.8	-6.4	-6.9	-6.9	-7.5	-7.3	-6.9	-7.4	-7.8	-7.5	-7.7	-7.3	-7.8	-8.5	-8.5	-8.6	-7.9	-7.6	-7.2	-7.0	-7.1	-7.4	-8.6	-8.9	-8.9	-9.3	-9.0	-8.3	-7.9
-4.1	-4.1	-3.9	-4.3	-4.2	-3.6	-2.9	-3.1	-3.3	-3.9	-4.8	-4.9	-4.4	-3.6	-3.0	-2.6	-2.0	-2.0	-1.6	-1.8	-2.5	-2.9	-3.3	-3.3	-2.9	-2.0	-1.7	-1.3	-1.6	-2.4	-3.1	-3.2	-3.1	-3.1	-3.1	-3.2
-.4	-.6	-.1	.3	.4	.3	.3	.1	-.1	-.7	-1.5	-1.5	-.6	.5	1.6	2.4	2.7	2.9	3.0	2.8	2.3	1.9	1.6	1.3	1.5	2.0	2.0	2.3	2.2	2.0	1.7	1.2	1.2	.9	.4	.3
2.1	1.8	2.2	3.0	3.2	3.0	2.8	2.8	2.6	2.5	2.5	3.9	3.8	4.3	4.8	5.1	5.1	4.9	4.6	4.1	3.9	4.0	4.6	5.1	4.5	4.0	4.7	5.4	5.4	5.0	5.1	5.1	4.2	3.5	2.9	2.5
4.3	4.1	4.5	5.4	6.4	6.5	6.3	6.3	6.8	6.6	6.3	7.0	6.4	6.3	6.4	7.3	8.5	9.9	10.5	10.9	10.8	11.2	11.8	11.9	9.6	10.0	12.1	12.6	12.7	12.3	12.0	11.9	10.8	9.5	6.6	4.8
8.4	8.3	8.2	8.4	9.0	9.5	10.1	10.7	10.8	10.0	9.1	8.7	8.8	9.2	9.8	10.6	11.1	11.5	11.8	12.0	12.4	12.8	13.2	13.3	13.4	13.4	13.4	13.3	13.2	13.0	12.8	12.3	11.6	10.8	9.2	8.6

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



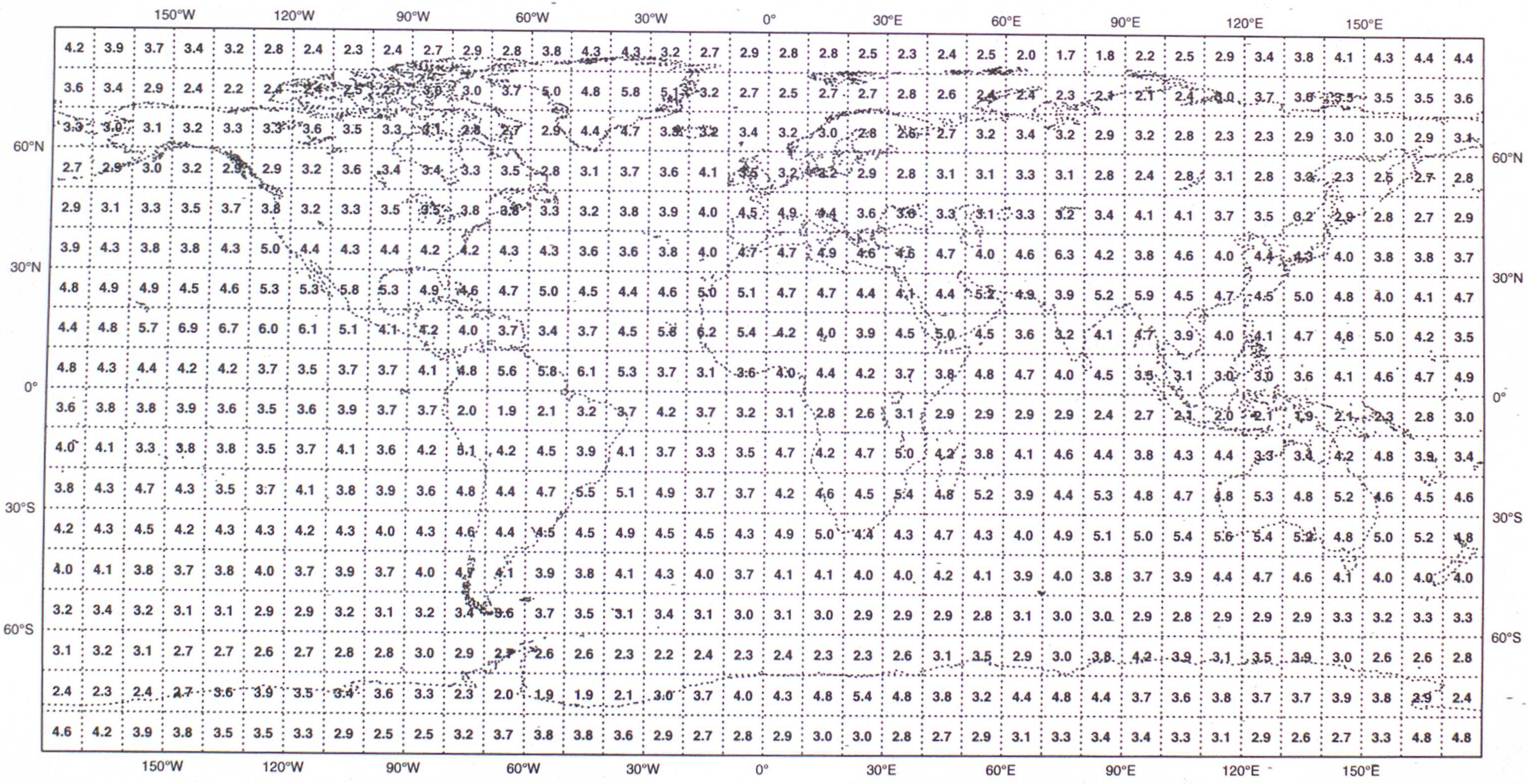
2.1	2.0	1.9	1.8	1.8	1.8	1.7	1.9	2.0	2.0	2.1	2.2	2.3	2.5	2.5	2.5	2.8	3.2	3.3	3.3	3.0	2.6	2.4	2.3	1.9	1.8	1.8	1.9	2.0	2.2	2.4	2.5	2.6	2.5	2.4	2.3
1.8	1.8	1.7	1.6	1.7	1.9	1.8	2.0	2.1	2.1	2.2	2.5	3.2	3.3	3.3	3.6	3.7	3.5	3.5	3.8	3.7	3.4	3.1	3.4	3.1	2.9	2.6	2.3	2.2	2.4	2.6	2.7	2.7	2.5	2.2	2.0
3.1	3.2	3.3	3.4	3.6	3.4	3.5	3.1	2.4	2.2	2.5	2.8	3.2	4.0	4.8	4.4	4.3	4.2	3.9	3.8	3.8	3.8	4.0	4.5	4.4	4.1	3.5	3.1	2.6	2.0	1.9	2.1	2.4	2.6	2.5	3.8
2.9	2.9	3.1	3.3	3.5	3.6	3.5	3.9	3.6	3.2	3.1	3.3	3.3	3.6	3.4	3.3	3.4	3.8	3.7	3.5	3.4	3.8	4.1	3.8	3.8	3.8	3.3	2.7	3.0	2.7	2.3	2.8	2.7	2.9	3.1	2.9
3.5	3.4	3.6	3.6	3.4	3.4	2.9	3.8	3.7	3.4	3.7	3.7	3.5	4.0	3.7	3.4	3.3	3.8	4.1	4.0	4.0	4.1	3.7	3.5	3.7	3.4	3.7	4.1	4.3	4.2	4.0	3.8	3.4	3.4	3.3	3.5
4.1	4.1	4.0	3.9	3.6	3.4	4.0	4.3	4.2	3.8	4.2	4.0	3.8	3.6	3.8	3.6	3.6	3.6	3.4	3.6	4.0	4.5	4.2	3.7	3.9	5.5	3.8	3.6	4.7	4.5	4.3	4.3	4.6	4.5	4.1	4.2
3.8	3.8	3.5	3.5	3.4	3.4	3.6	3.9	3.8	3.6	3.5	3.6	3.8	3.6	3.7	3.7	3.5	3.9	3.7	4.1	3.9	4.1	3.8	4.0	4.1	3.8	5.2	5.2	4.2	4.1	3.8	3.4	3.6	3.8	3.7	3.8
3.4	3.5	3.4	3.4	3.4	3.3	3.3	3.5	3.5	3.4	3.4	3.3	3.4	3.3	3.4	3.4	3.5	4.0	3.6	3.8	3.9	3.7	3.4	3.3	3.3	3.4	3.3	3.3	3.3	3.3	3.2	3.3	3.3	3.3	3.3	3.3
3.3	3.4	3.3	3.3	3.3	3.3	3.3	3.4	3.3	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.6	3.4	3.7	3.8	3.6	3.5	3.3	3.4	3.3	3.4	3.3	3.2	3.3	3.4	3.3	3.4	3.3	3.3	3.2
3.4	3.4	3.3	3.4	3.3	3.3	3.2	3.3	3.2	3.3	3.3	3.2	3.2	3.3	3.4	3.3	3.3	3.4	3.3	3.3	3.3	3.2	3.4	3.3	3.4	3.3	3.4	3.3	3.3	3.1	2.9	3.3	3.9	3.5	3.3	3.2
3.4	3.3	3.4	3.5	3.4	3.4	3.4	3.3	3.3	3.2	3.4	3.5	3.3	3.3	3.3	3.3	3.3	3.2	3.2	3.4	3.4	3.2	3.3	3.3	3.3	3.3	3.3	3.2	3.3	3.3	3.1	3.3	3.3	3.3	3.4	3.3
3.5	3.4	3.4	3.4	3.3	3.4	3.4	3.3	3.3	3.1	3.2	3.8	3.4	3.4	3.4	3.3	3.3	3.1	3.3	3.7	3.7	3.4	3.3	3.5	3.4	3.7	3.7	3.1	3.4	3.4	3.7	4.2	3.7	3.4	3.4	3.3
3.5	3.5	3.5	3.6	3.4	3.4	3.3	3.3	3.5	3.3	3.3	3.5	3.5	3.6	3.5	3.4	3.4	3.2	3.7	3.9	3.6	3.4	3.4	3.5	3.5	3.9	4.1	3.7	3.7	3.8	3.9	4.4	4.4	3.9	3.6	3.6
3.4	3.7	3.6	3.7	3.6	3.6	3.5	3.4	3.4	3.4	3.5	3.6	3.3	3.5	3.6	3.8	3.8	3.6	3.9	4.0	3.8	3.5	3.5	3.6	3.6	3.7	3.7	3.5	3.5	3.5	3.8	3.7	3.6	3.6	3.5	3.7
3.1	3.5	3.4	3.2	2.9	3.0	3.0	2.7	2.8	3.2	3.4	3.4	3.4	3.0	3.2	3.4	3.0	2.8	2.7	2.7	2.7	2.6	2.7	3.1	3.1	2.7	2.7	2.6	2.4	2.5	2.8	2.9	2.8	2.9	2.9	2.9
2.7	2.9	2.9	2.6	2.4	2.4	2.4	2.3	2.4	2.4	2.6	2.7	2.7	2.4	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.2	2.8	3.2	2.9	2.5	3.1	3.4	3.3	3.1	3.3	3.5	3.0	2.6	2.5	2.7
2.5	2.4	2.3	2.4	2.5	2.6	2.6	2.6	2.5	2.5	2.1	1.7	1.8	1.8	1.7	2.2	2.3	2.3	2.5	2.8	3.1	2.6	2.1	1.9	2.7	2.8	2.5	2.0	1.9	1.9	1.7	1.7	1.9	2.2	2.5	2.4
2.4	2.2	2.2	2.2	2.0	1.9	1.8	1.5	1.3	1.4	1.8	2.0	2.1	2.1	1.8	1.4	1.3	1.3	1.4	1.4	1.4	1.3	1.3	1.5	1.6	1.6	1.6	1.5	1.4	1.3	1.2	1.2	1.3	1.7	2.5	2.5

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



10.7	11.0	11.2	11.5	11.5	11.6	11.7	11.5	11.4	11.8	12.1	11.4	12.3	12.6	13.1	11.3	10.0	9.2	8.4	8.0	8.4	8.9	8.8	8.8	9.9	10.2	10.1	9.9	10.0	10.0	9.9	10.0	10.0	10.1	10.2	10.4
10.3	10.3	10.4	10.7	11.0	10.8	10.9	10.4	9.7	10.4	10.1	10.0	10.9	13.2	15.1	11.1	6.5	4.7	4.0	4.8	5.8	6.2	6.4	7.6	9.0	9.7	10.4	10.6	11.0	11.2	10.7	10.2	10.0	9.8	9.9	10.0
8.6	5.4	5.8	6.0	5.9	6.2	6.9	8.5	9.9	9.6	9.0	8.0	5.3	7.7	5.1	3.7	2.9	2.3	2.8	3.8	4.4	5.3	5.7	6.3	6.5	7.2	8.2	10.1	11.6	12.8	13.8	14.5	12.5	10.5	8.9	7.8
3.0	2.5	2.3	1.9	2.5	2.8	2.5	4.1	5.9	6.8	7.7	7.1	3.9	2.6	1.4	.6	-.5	.2	1.1	1.7	2.9	4.1	4.3	4.6	4.6	4.8	5.8	7.3	7.9	9.7	10.6	11.0	7.0	5.0	4.3	3.4
1.4	1.0	.9	.6	.2	.5	1.8	1.7	2.0	2.4	2.6	2.2	1.4	1.3	-.2	-1.3	-.8	-2.0	-1.8	.1	1.2	2.0	2.4	1.7	1.3	2.2	3.1	4.6	4.6	5.2	5.4	4.9	3.9	3.1	2.1	2.1
-2.0	-2.0	-1.7	-2.2	-2.6	-2.9	-1.5	-1.0	-2.0	-1.7	-2.1	-2.5	-2.3	-1.6	-1.6	-1.6	-2.5	-3.5	-4.0	-4.1	-3.0	-2.2	-2.2	-2.6	-2.7	.8	3.4	4.4	.3	-1.2	-2.0	-2.3	-2.0	-1.8	-2.2	-1.8
-8.5	-7.8	-6.7	-6.3	-5.5	-7.6	-8.1	-7.5	-8.2	-7.9	-9.9	-10.6	-9.7	-8.2	-7.8	-7.6	-8.6	-7.8	-8.0	-8.4	-9.3	-11.4	-9.1	-10.0	-12.1	-12.1	-10.1	-9.0	-8.4	-7.4	-8.3	-9.1	-9.3	-8.3	-8.9	-9.0
-13.8	-12.4	-10.0	-9.3	-9.1	-8.6	-8.6	-8.9	-9.6	-11.4	-14.3	-14.9	-15.3	-13.9	-12.7	-11.5	-9.4	-8.4	-10.1	-11.6	-12.4	-11.2	-12.1	-14.8	-16.3	-14.8	-14.5	-13.7	-11.3	-10.0	-8.9	-8.6	-9.5	-12.3	-14.0	-14.9
-10.0	-10.1	-9.6	-8.8	-7.5	-6.9	-7.5	-8.3	-8.5	-7.9	-6.8	-8.5	-9.1	-8.1	-5.5	-4.4	-4.8	-5.9	-8.1	-8.7	-6.9	-6.0	-9.6	-10.2	-10.3	-8.6	-6.3	-5.2	-5.5	-4.7	-4.2	-4.4	-5.0	-6.2	-6.9	-9.2
-6.8	-6.9	-8.1	-9.6	-9.5	-9.4	-10.0	-10.0	-9.9	-6.4	-2.0	-2.1	-2.0	-5.1	-4.9	-7.0	-7.9	-6.5	-4.8	-2.9	-2.2	-4.4	-5.4	-4.2	-3.5	-3.8	-2.8	-2.7	-2.2	-2.5	-3.1	-2.5	-3.1	-3.8	-5.1	-6.5
-6.6	-5.0	-4.2	-6.4	-7.7	-9.0	-10.1	-9.8	-11.1	-10.3	-7.0	-5.9	-6.4	-5.1	-6.5	-11.9	-13.6	-12.9	-10.7	-6.5	-6.2	-7.2	-5.7	-6.8	-7.4	-7.6	-8.7	-9.3	-9.0	-7.7	-5.9	-5.9	-8.9	-8.2	-7.2	-6.9
-7.4	-6.8	-5.8	-5.5	-5.8	-6.6	-7.9	-8.5	-10.5	-13.2	-13.2	-8.5	-9.4	-7.6	-5.4	-10.4	-12.4	-13.1	-13.3	-11.0	-8.3	-8.2	-7.7	-6.8	-7.7	-9.4	-10.2	-11.0	-11.9	-11.1	-10.3	-9.7	-10.9	-11.4	-10.8	-8.6
-5.8	-6.1	-5.8	-4.7	-4.8	-5.4	-5.1	-4.7	-5.1	-7.9	-10.6	-7.9	-7.7	-6.7	-5.0	-3.8	-4.7	-6.4	-7.5	-8.1	-7.2	-6.3	-6.2	-5.8	-6.5	-6.8	-6.3	-6.9	-8.2	-8.9	-8.6	-7.9	-7.4	-6.8	-6.7	-5.9
-2.0	-2.3	-2.6	-3.0	-2.6	-2.5	-1.9	-1.9	-1.5	-3.0	-4.8	-4.0	-3.7	-3.0	-3.0	-2.6	-2.1	-2.0	-1.6	-1.5	-2.1	-2.5	-3.1	-3.1	-3.1	-2.8	-2.0	-1.8	-2.1	-3.0	-3.8	-3.5	-3.3	-2.9	-2.4	-1.7
-.2	-.4	-.6	-.7	-.7	-.2	.2	.1	-.5	-.2	-.3	-.5	-.4	-.3	-.4	.7	1.2	1.6	1.6	1.4	1.2	1.0	1.0	.7	.7	.7	.8	1.0	.9	.9	.8	.6	.3	.3	.1	.5
1.3	1.0	.9	1.0	1.3	1.6	1.3	1.2	1.0	.8	1.1	1.8	1.9	2.4	2.9	3.1	2.9	3.2	3.1	3.3	2.9	2.7	3.2	3.9	2.8	1.8	2.7	3.8	4.1	3.9	4.4	4.5	3.3	2.3	2.3	2.0
3.2	3.1	3.1	3.5	4.7	4.8	4.5	4.5	5.0	5.0	4.5	5.2	4.5	4.2	3.7	4.7	6.8	9.9	11.4	12.2	12.0	12.7	13.6	13.8	9.1	9.8	14.3	15.6	16.0	15.5	15.4	15.2	13.0	10.5	5.4	3.5
7.2	6.7	6.5	7.3	8.4	9.3	10.5	12.0	12.0	10.0	8.0	7.1	7.4	8.1	9.2	10.9	12.3	13.3	13.8	14.5	15.1	15.9	17.0	17.4	17.7	18.0	18.1	18.0	17.8	17.5	16.9	15.8	14.3	12.3	8.8	7.5

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



4.2	3.9	3.7	3.4	3.2	2.8	2.4	2.3	2.4	2.7	2.9	2.8	3.8	4.3	4.3	3.2	2.7	2.9	2.8	2.8	2.5	2.3	2.4	2.5	2.0	1.7	1.8	2.2	2.5	2.9	3.4	3.8	4.1	4.3	4.4	4.4
3.6	3.4	2.9	2.4	2.2	2.4	2.4	2.5	2.7	3.0	3.0	3.7	5.0	4.8	5.8	5.1	3.2	2.7	2.5	2.7	2.7	2.8	2.6	2.4	2.4	2.3	2.1	2.1	2.4	3.0	3.7	3.6	3.5	3.5	3.5	3.6
3.3	3.0	3.1	3.2	3.3	3.3	3.6	3.5	3.3	4.1	2.8	2.7	2.9	4.4	4.7	3.8	3.2	3.4	3.2	3.0	2.8	2.6	2.7	3.2	3.4	3.2	2.9	3.2	2.8	2.3	2.3	2.9	3.0	3.0	2.9	3.1
2.7	2.9	3.0	3.2	2.9	2.9	3.2	3.6	3.4	3.4	3.3	3.5	2.8	3.1	3.7	3.6	4.1	3.5	3.2	3.2	2.9	2.8	3.1	3.1	3.3	3.1	2.8	2.4	2.8	3.1	2.8	3.3	2.3	2.5	2.7	2.8
2.9	3.1	3.3	3.5	3.7	3.8	3.2	3.3	3.5	3.5	3.8	3.8	3.3	3.2	3.8	3.9	4.0	4.5	4.9	4.4	3.6	3.6	3.3	3.1	3.3	3.2	3.4	4.1	4.1	3.7	3.5	3.2	2.9	2.8	2.7	2.9
3.9	4.3	3.8	3.8	4.3	5.0	4.4	4.3	4.4	4.2	4.2	4.3	4.3	3.6	3.6	3.8	4.0	4.7	4.7	4.9	4.6	4.6	4.7	4.0	4.6	6.3	4.2	3.8	4.6	4.0	4.4	4.3	4.0	3.8	3.8	3.7
4.8	4.9	4.9	4.5	4.6	5.3	5.3	5.8	5.3	4.9	4.6	4.7	5.0	4.5	4.4	4.6	5.0	5.1	4.7	4.7	4.4	4.1	4.4	5.2	4.9	3.9	5.2	5.9	4.5	4.7	4.5	5.0	4.8	4.0	4.1	4.7
4.4	4.8	5.7	6.9	6.7	6.0	6.1	5.1	4.1	4.2	4.0	3.7	3.4	3.7	4.5	5.8	6.2	5.4	4.2	4.0	3.9	4.5	5.0	4.5	3.6	3.2	4.1	4.7	3.9	4.0	4.1	4.7	4.8	5.0	4.2	3.5
4.8	4.3	4.4	4.2	4.2	3.7	3.5	3.7	3.7	4.1	4.8	5.6	5.8	6.1	5.3	3.7	3.1	3.6	4.0	4.4	4.2	3.7	3.8	4.8	4.7	4.0	4.5	3.5	3.1	3.0	3.0	3.6	4.1	4.6	4.7	4.9
3.6	3.8	3.8	3.9	3.6	3.5	3.6	3.9	3.7	3.7	2.0	1.9	2.1	3.2	3.7	4.2	3.7	3.2	3.1	2.8	2.6	3.1	2.9	2.9	2.9	2.9	2.4	2.7	2.1	2.0	2.1	1.9	2.1	2.3	2.8	3.0
4.0	4.1	3.3	3.8	3.8	3.5	3.7	4.1	3.6	4.2	5.1	4.2	4.5	3.9	4.1	3.7	3.3	3.5	4.7	4.2	4.7	5.0	4.2	3.8	4.1	4.6	4.4	3.8	4.3	4.4	3.3	3.4	4.2	4.8	3.9	3.4
3.8	4.3	4.7	4.3	3.5	3.7	4.1	3.8	3.9	3.6	4.8	4.4	4.7	5.5	5.1	4.9	3.7	3.7	4.2	4.6	4.5	5.4	4.8	5.2	3.9	4.4	5.3	4.8	4.7	4.8	5.3	4.8	5.2	4.6	4.5	4.6
4.2	4.3	4.5	4.2	4.3	4.3	4.2	4.3	4.0	4.3	4.6	4.4	4.5	4.5	4.9	4.5	4.5	4.3	4.9	5.0	4.4	4.3	4.7	4.3	4.0	4.9	5.1	5.0	5.4	5.6	5.4	5.2	4.8	5.0	5.2	4.8
4.0	4.1	3.8	3.7	3.8	4.0	3.7	3.9	3.7	4.0	4.7	4.1	3.9	3.8	4.1	4.3	4.0	3.7	4.1	4.1	4.0	4.0	4.2	4.1	3.9	4.0	3.8	3.7	3.9	4.4	4.7	4.6	4.1	4.0	4.0	4.0
3.2	3.4	3.2	3.1	3.1	2.9	2.9	3.2	3.1	3.2	3.4	3.6	3.7	3.5	3.1	3.4	3.1	3.0	3.1	3.0	2.9	2.9	2.9	2.8	3.1	3.0	3.0	2.9	2.8	2.9	2.9	2.9	3.3	3.2	3.3	3.3
3.1	3.2	3.1	2.7	2.7	2.6	2.7	2.8	2.8	3.0	2.9	2.7	2.6	2.6	2.3	2.2	2.4	2.3	2.4	2.3	2.3	2.6	3.1	3.5	2.9	3.0	3.8	4.2	3.9	3.1	3.5	3.9	3.0	2.6	2.6	2.8
2.4	2.3	2.4	2.7	3.6	3.9	3.5	3.4	3.6	3.3	2.3	2.0	1.9	1.9	2.1	3.0	3.7	4.0	4.3	4.8	5.4	4.8	3.8	3.2	4.4	4.8	4.4	3.7	3.6	3.8	3.7	3.7	3.9	3.8	2.9	2.4
4.6	4.2	3.9	3.8	3.5	3.5	3.3	2.9	2.5	2.5	3.2	3.7	3.8	3.8	3.6	2.9	2.7	2.8	2.9	3.0	3.0	2.8	2.7	2.9	3.1	3.3	3.4	3.4	3.3	3.1	2.9	2.6	2.7	3.3	4.8	4.8

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations

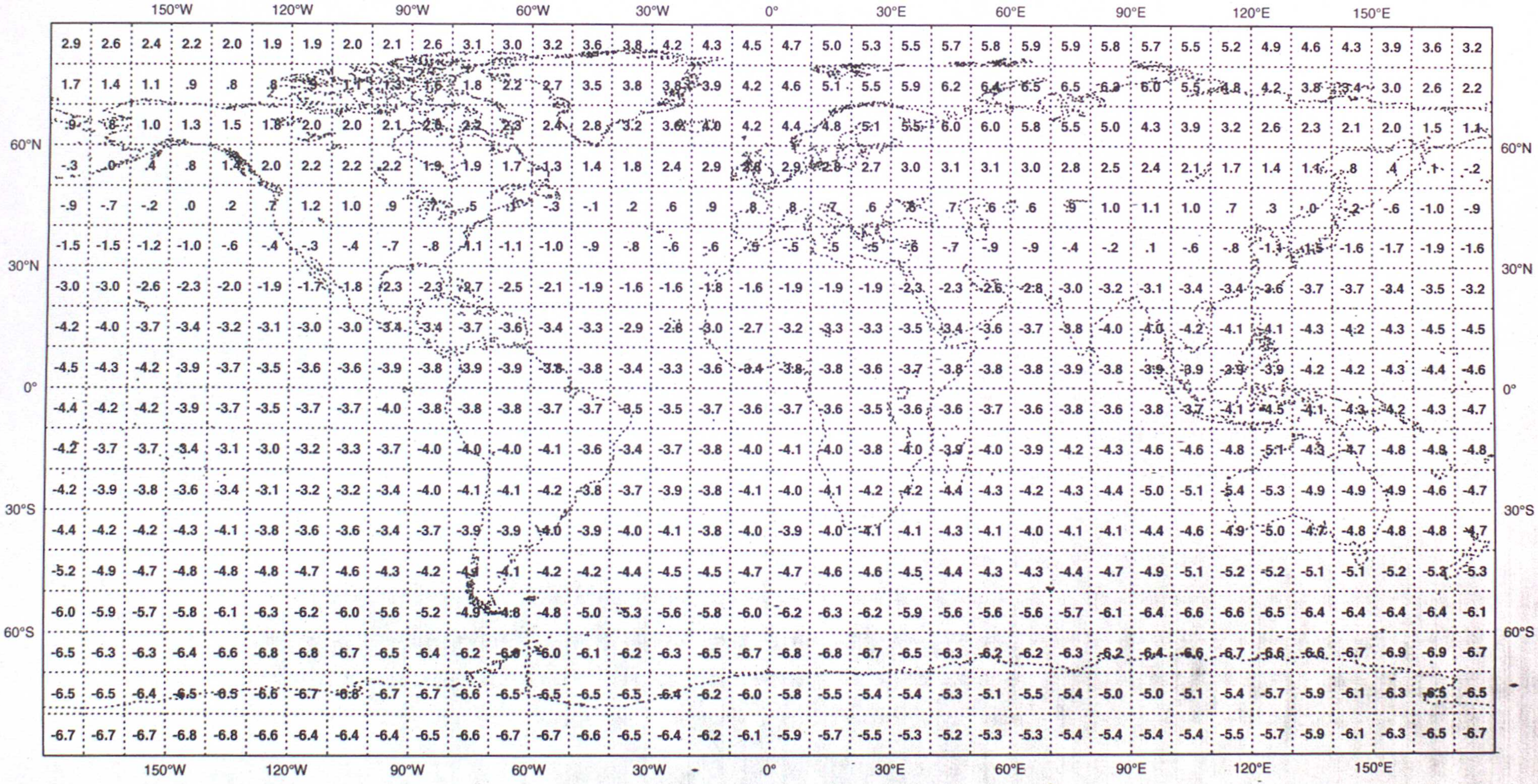
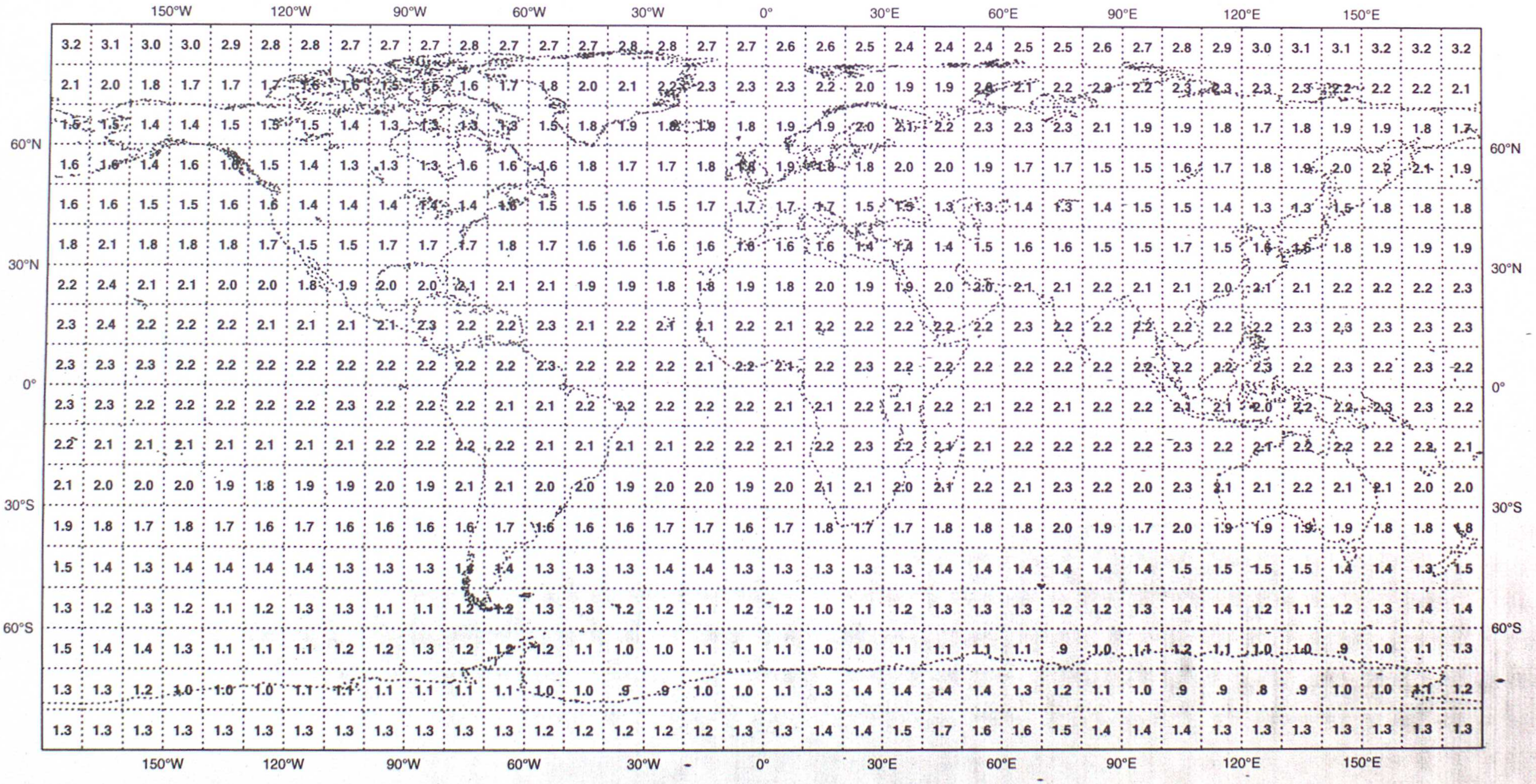

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2.9 2.6 2.4 2.2 2.0 1.9 1.9 2.0 2.1 2.6 3.1 3.0 3.2 3.6 3.8 4.2 4.3 4.5 4.7 5.0 5.3 5.5 5.7 5.8 5.9 5.9 5.8 5.7 5.5 5.2 4.9 4.6 4.3 3.9 3.6 3.2
1.7 1.4 1.1 .9 .8 .8 .9 1.1 1.3 1.6 1.8 2.2 2.7 3.5 3.8 3.8 3.9 4.2 4.6 5.1 5.5 5.9 6.2 6.4 6.5 6.5 6.3 6.0 5.5 4.8 4.2 3.8 3.4 3.0 2.6 2.2
.9 .8 1.0 1.3 1.5 1.8 2.0 2.0 2.1 2.5 2.2 2.3 2.4 2.8 3.2 3.6 4.0 4.2 4.4 4.8 5.1 5.5 6.0 6.0 5.8 5.5 5.0 4.3 3.9 3.2 2.6 2.3 2.1 2.0 1.5 1.1
-.3 .0 .4 .8 1.4 2.0 2.2 2.2 2.2 1.9 1.9 1.7 1.3 1.4 1.8 2.4 2.9 2.8 2.9 2.8 2.7 3.0 3.1 3.1 3.0 2.8 2.5 2.4 2.1 1.7 1.4 1.1 .8 .4 .1 -.2
-.9 -.7 -.2 .0 .2 .7 1.2 1.0 .9 .7 .5 .1 -.3 -.1 .2 .6 .9 .8 .8 .7 .6 .8 .7 .6 .6 .9 1.0 1.1 1.0 .7 .3 .0 -.2 -.6 -1.0 -.9
-1.5 -1.5 -1.2 -1.0 -.6 -.4 -.3 -.4 -.7 -.8 -1.1 -1.1 -1.0 -.9 -.8 -.6 -.6 -.5 -.5 -.5 -.5 -.6 -.7 -.9 -.9 -.4 -.2 .1 -.6 -.8 -1.1 -1.5 -1.6 -1.7 -1.9 -1.6
-3.0 -3.0 -2.6 -2.3 -2.0 -1.9 -1.7 -1.8 -2.3 -2.3 -2.7 -2.5 -2.1 -1.9 -1.6 -1.6 -1.8 -1.6 -1.9 -1.9 -1.9 -2.3 -2.3 -2.6 -2.8 -3.0 -3.2 -3.1 -3.4 -3.4 -3.6 -3.7 -3.7 -3.4 -3.5 -3.2
-4.2 -4.0 -3.7 -3.4 -3.2 -3.1 -3.0 -3.0 -3.4 -3.4 -3.7 -3.6 -3.4 -3.3 -2.9 -2.8 -3.0 -2.7 -3.2 -3.3 -3.3 -3.5 -3.4 -3.6 -3.7 -3.8 -4.0 -4.0 -4.2 -4.1 -4.1 -4.3 -4.2 -4.3 -4.5 -4.5
-4.5 -4.3 -4.2 -3.9 -3.7 -3.5 -3.6 -3.6 -3.9 -3.8 -3.9 -3.9 -3.8 -3.8 -3.4 -3.3 -3.6 -3.4 -3.8 -3.8 -3.6 -3.7 -3.8 -3.8 -3.8 -3.9 -3.8 -3.9 -3.9 -3.9 -3.9 -4.2 -4.2 -4.3 -4.4 -4.6
-4.4 -4.2 -4.2 -3.9 -3.7 -3.5 -3.7 -3.7 -4.0 -3.8 -3.8 -3.8 -3.7 -3.7 -3.5 -3.5 -3.7 -3.6 -3.7 -3.6 -3.5 -3.6 -3.6 -3.7 -3.6 -3.8 -3.6 -3.8 -3.7 -4.1 -4.5 -4.1 -4.3 -4.2 -4.3 -4.7
-4.2 -3.7 -3.7 -3.4 -3.1 -3.0 -3.2 -3.3 -3.7 -4.0 -4.0 -4.0 -4.1 -3.6 -3.4 -3.7 -3.8 -4.0 -4.1 -4.0 -3.8 -4.0 -3.9 -4.0 -3.9 -4.2 -4.3 -4.6 -4.6 -4.8 -5.1 -4.3 -4.7 -4.8 -4.8 -4.8
-4.2 -3.9 -3.8 -3.6 -3.4 -3.1 -3.2 -3.2 -3.4 -4.0 -4.1 -4.1 -4.2 -3.8 -3.7 -3.9 -3.8 -4.1 -4.0 -4.1 -4.2 -4.2 -4.4 -4.3 -4.2 -4.3 -4.4 -5.0 -5.1 -5.4 -5.3 -4.9 -4.9 -4.9 -4.6 -4.7
-4.4 -4.2 -4.2 -4.3 -4.1 -3.8 -3.6 -3.6 -3.4 -3.7 -3.9 -3.9 -4.0 -3.9 -4.0 -4.1 -3.8 -4.0 -3.9 -4.0 -4.1 -4.1 -4.3 -4.1 -4.0 -4.1 -4.1 -4.4 -4.6 -4.9 -5.0 -4.7 -4.8 -4.8 -4.8 -4.7
-5.2 -4.9 -4.7 -4.8 -4.8 -4.8 -4.7 -4.6 -4.3 -4.2 -4.1 -4.1 -4.2 -4.2 -4.4 -4.5 -4.5 -4.7 -4.7 -4.6 -4.6 -4.5 -4.4 -4.3 -4.3 -4.4 -4.7 -4.9 -5.1 -5.2 -5.2 -5.1 -5.1 -5.2 -5.3 -5.3
-6.0 -5.9 -5.7 -5.8 -6.1 -6.3 -6.2 -6.0 -5.6 -5.2 -4.9 -4.8 -4.8 -5.0 -5.3 -5.6 -5.8 -6.0 -6.2 -6.3 -6.2 -5.9 -5.6 -5.6 -5.6 -5.7 -6.1 -6.4 -6.6 -6.6 -6.5 -6.4 -6.4 -6.4 -6.4 -6.1
-6.5 -6.3 -6.3 -6.4 -6.6 -6.8 -6.8 -6.7 -6.5 -6.4 -6.2 -6.0 -6.0 -6.1 -6.2 -6.3 -6.5 -6.7 -6.8 -6.8 -6.7 -6.5 -6.3 -6.2 -6.2 -6.3 -6.2 -6.4 -6.6 -6.7 -6.6 -6.6 -6.7 -6.9 -6.9 -6.7
-6.5 -6.5 -6.4 -6.5 -6.5 -6.6 -6.7 -6.8 -6.7 -6.7 -6.6 -6.5 -6.5 -6.5 -6.5 -6.4 -6.2 -6.0 -5.8 -5.5 -5.4 -5.4 -5.3 -5.1 -5.5 -5.4 -5.0 -5.0 -5.1 -5.4 -5.7 -5.9 -6.1 -6.3 -6.5 -6.5
-6.7 -6.7 -6.7 -6.8 -6.8 -6.6 -6.4 -6.4 -6.4 -6.5 -6.6 -6.7 -6.7 -6.6 -6.5 -6.4 -6.2 -6.1 -5.9 -5.7 -5.5 -5.3 -5.2 -5.3 -5.3 -5.4 -5.4 -5.4 -5.4 -5.5 -5.7 -5.9 -6.1 -6.3 -6.5 -6.7

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



3.2	3.1	3.0	3.0	2.9	2.8	2.8	2.7	2.7	2.7	2.8	2.7	2.7	2.7	2.8	2.8	2.7	2.7	2.6	2.6	2.5	2.4	2.4	2.4	2.5	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.1	3.2	3.2	3.2
2.1	2.0	1.8	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.6	1.7	1.8	2.0	2.1	2.2	2.3	2.3	2.3	2.2	2.0	1.9	1.9	2.8	2.1	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1
1.5	1.5	1.4	1.4	1.5	1.5	1.5	1.4	1.3	1.3	1.3	1.3	1.5	1.8	1.9	1.8	1.9	1.8	1.9	1.9	2.0	2.1	2.2	2.3	2.3	2.3	2.1	1.9	1.9	1.8	1.7	1.8	1.9	1.9	1.8	1.7
1.6	1.6	1.4	1.6	1.6	1.5	1.4	1.3	1.3	1.3	1.6	1.6	1.6	1.8	1.7	1.7	1.8	1.8	1.9	1.8	1.8	2.0	2.0	1.9	1.7	1.7	1.5	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.1	1.9
1.6	1.6	1.5	1.5	1.6	1.6	1.4	1.4	1.4	1.4	1.4	1.6	1.5	1.5	1.6	1.5	1.7	1.7	1.7	1.7	1.5	1.5	1.3	1.3	1.4	1.3	1.4	1.5	1.5	1.4	1.3	1.3	1.5	1.8	1.8	1.8
1.8	2.1	1.8	1.8	1.8	1.7	1.5	1.5	1.7	1.7	1.7	1.8	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.4	1.4	1.4	1.5	1.6	1.6	1.5	1.5	1.7	1.5	1.6	1.6	1.8	1.9	1.9	1.9
2.2	2.4	2.1	2.1	2.0	2.0	1.8	1.9	2.0	2.0	2.1	2.1	2.1	1.9	1.9	1.8	1.8	1.9	1.8	2.0	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.0	2.1	2.1	2.2	2.2	2.2	2.3
2.3	2.4	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.3	2.1	2.2	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3
2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.2
2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.0	2.2	2.2	2.3	2.3	2.2
2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.2	2.2	2.2	2.2	2.1
2.1	2.0	2.0	2.0	1.9	1.8	1.9	1.9	2.0	1.9	2.1	2.1	2.0	2.0	1.9	2.0	2.0	1.9	2.0	2.1	2.1	2.0	2.1	2.2	2.1	2.3	2.2	2.0	2.3	2.1	2.1	2.2	2.1	2.1	2.0	2.0
1.9	1.8	1.7	1.8	1.7	1.6	1.7	1.6	1.6	1.6	1.6	1.7	1.6	1.6	1.6	1.7	1.7	1.6	1.7	1.8	1.7	1.7	1.8	1.8	1.8	2.0	1.9	1.7	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.8
1.5	1.4	1.3	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.4	1.4	1.3	1.5
1.3	1.2	1.3	1.2	1.1	1.2	1.3	1.3	1.1	1.1	1.2	1.2	1.3	1.3	1.2	1.2	1.1	1.2	1.2	1.0	1.1	1.2	1.3	1.3	1.3	1.2	1.2	1.3	1.4	1.4	1.2	1.1	1.2	1.3	1.4	1.4
1.5	1.4	1.4	1.3	1.1	1.1	1.1	1.2	1.2	1.3	1.2	1.2	1.2	1.1	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.1	.9	1.0	1.1	1.2	1.1	1.0	1.0	.9	1.0	1.1	1.3
1.3	1.3	1.2	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	.9	.9	1.0	1.0	1.1	1.3	1.4	1.4	1.4	1.4	1.3	1.2	1.1	1.0	.9	.9	.8	.9	1.0	1.0	1.1	1.2
1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.7	1.6	1.6	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

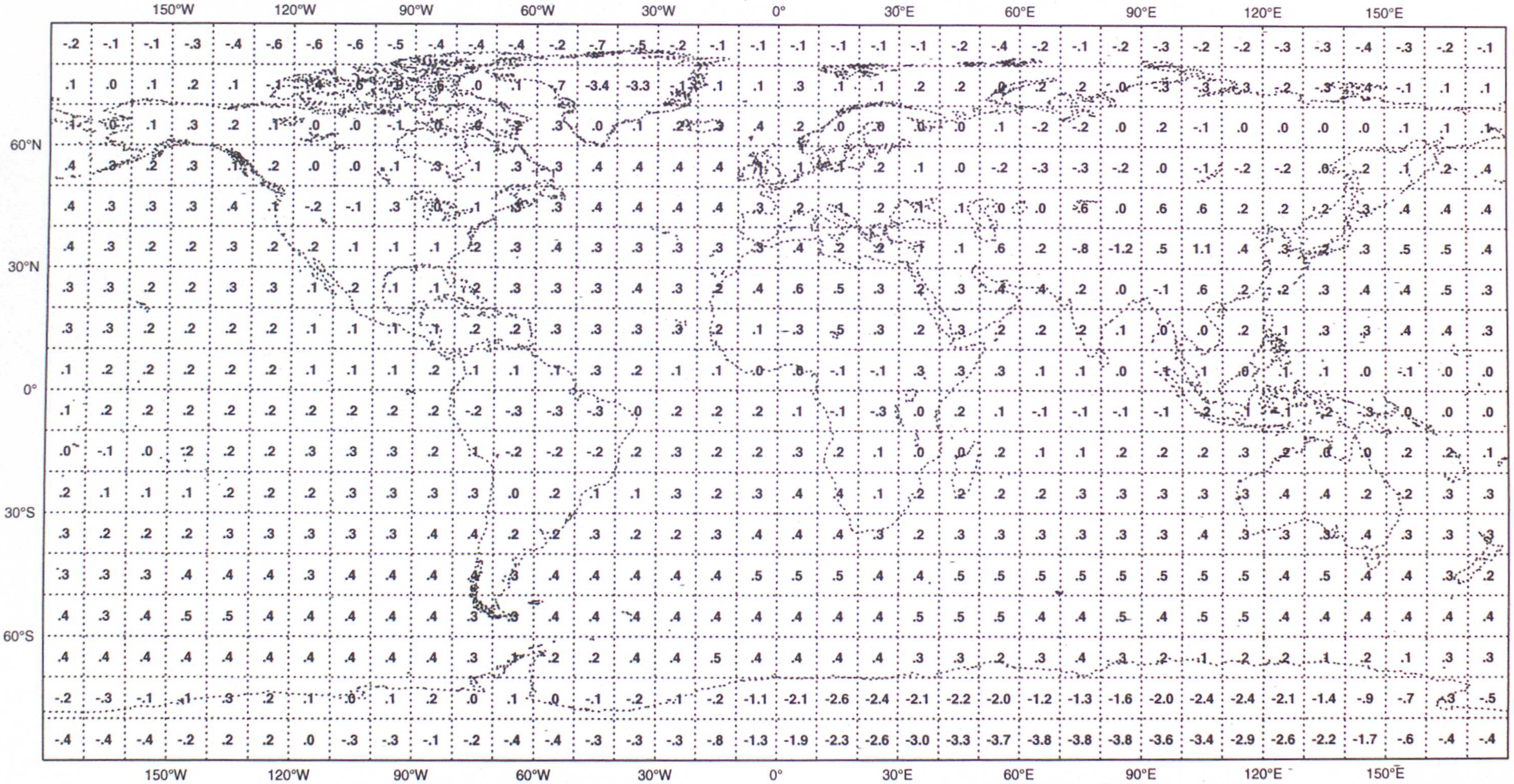

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

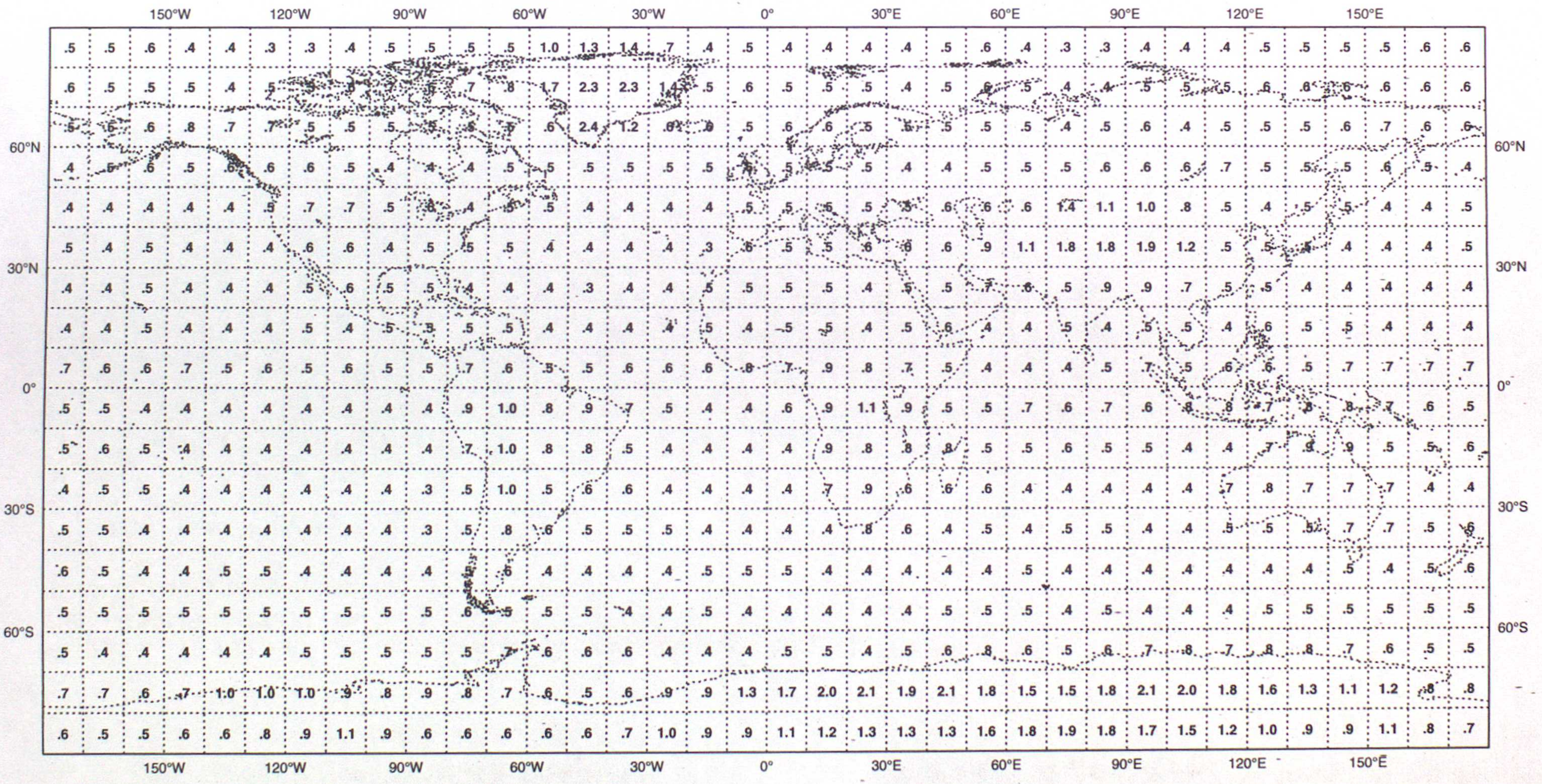

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .6 .4 .4 .3 .3 .4 .5 .5 .5 .5 1.0 1.3 1.4 .7 .4 .5 .4 .4 .4 .4 .5 .6 .4 .3 .3 .4 .4 .4 .5 .5 .5 .5 .6 .6
.6 .5 .5 .5 .4 .5 .5 .5 .7 .6 .7 .8 1.7 2.3 2.3 1.4 .5 .6 .5 .5 .5 .4 .5 .6 .5 .4 .4 .5 .5 .5 .6 .6 .6 .6 .6 .6
.5 .6 .6 .8 .7 .7 .5 .5 .5 .5 .6 .5 .6 2.4 1.2 .6 .6 .5 .6 .6 .5 .5 .5 .5 .5 .4 .5 .6 .4 .5 .5 .5 .6 .7 .6 .6
.4 .5 .6 .5 .6 .6 .6 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5 .6 .6 .6 .7 .5 .5 .5 .6 .5 .4
.4 .4 .4 .4 .4 .5 .7 .7 .5 .6 .4 .5 .5 .4 .4 .4 .4 .5 .5 .6 .5 .5 .6 .6 .6 1.4 1.1 1.0 .8 .5 .4 .5 .5 .4 .4 .5
.5 .4 .5 .4 .4 .4 .6 .6 .4 .5 .5 .5 .4 .4 .4 .4 .3 .6 .5 .5 .6 .6 .6 .9 1.1 1.8 1.8 1.9 1.2 .5 .5 .4 .4 .4 .4 .5
.4 .4 .5 .4 .4 .4 .5 .6 .5 .5 .4 .4 .4 .3 .4 .4 .5 .5 .5 .5 .4 .5 .5 .7 .6 .5 .9 .9 .7 .5 .5 .4 .4 .4 .4 .4
.4 .4 .5 .4 .4 .4 .5 .4 .5 .3 .5 .5 .4 .4 .4 .4 .5 .4 .5 .5 .4 .5 .6 .4 .4 .5 .4 .5 .5 .4 .6 .5 .5 .4 .4 .4
.7 .6 .6 .7 .5 .6 .5 .6 .5 .5 .7 .6 .5 .5 .6 .6 .6 .8 .7 .9 .8 .7 .5 .4 .4 .4 .5 .7 .5 .6 .6 .5 .7 .7 .7 .7
.5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .9 1.0 .8 .9 .7 .5 .4 .4 .6 .9 1.1 .9 .5 .5 .7 .6 .7 .6 .8 .8 .7 .8 .8 .7 .6 .5
.5 .6 .5 .4 .4 .4 .4 .4 .4 .4 .7 1.0 .8 .8 .5 .4 .4 .4 .4 .9 .8 .8 .8 .5 .5 .6 .5 .5 .4 .4 .7 .9 .9 .5 .5 .6
.4 .5 .5 .4 .4 .4 .4 .4 .4 .3 .5 1.0 .5 .6 .6 .4 .4 .4 .4 .7 .9 .6 .6 .6 .4 .4 .4 .4 .4 .7 .8 .7 .7 .7 .4 .4
.5 .5 .4 .4 .4 .4 .4 .4 .4 .3 .5 .8 .6 .5 .5 .5 .4 .4 .4 .4 .8 .6 .4 .5 .4 .5 .5 .4 .4 .5 .5 .5 .7 .7 .5 .6
.6 .5 .4 .4 .5 .5 .4 .4 .4 .4 .5 .6 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .6
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .4 .4 .5 .4 .4 .4 .4 .4 .5 .5 .5 .4 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5
.5 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .7 .6 .6 .6 .4 .4 .4 .5 .5 .4 .5 .6 .8 .6 .5 .6 .7 .8 .7 .8 .8 .7 .6 .5 .5
.7 .7 .6 .7 1.0 1.0 1.0 .9 .8 .9 .8 .7 .6 .5 .6 .9 .9 1.3 1.7 2.0 2.1 1.9 2.1 1.8 1.5 1.5 1.8 2.1 2.0 1.8 1.6 1.3 1.1 1.2 .8 .8
.6 .5 .5 .6 .6 .8 .9 1.1 .9 .6 .6 .6 .6 .6 .7 1.0 .9 .9 1.1 1.2 1.3 1.3 1.3 1.6 1.8 1.9 1.8 1.7 1.5 1.2 1.0 .9 .9 1.1 .8 .7

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

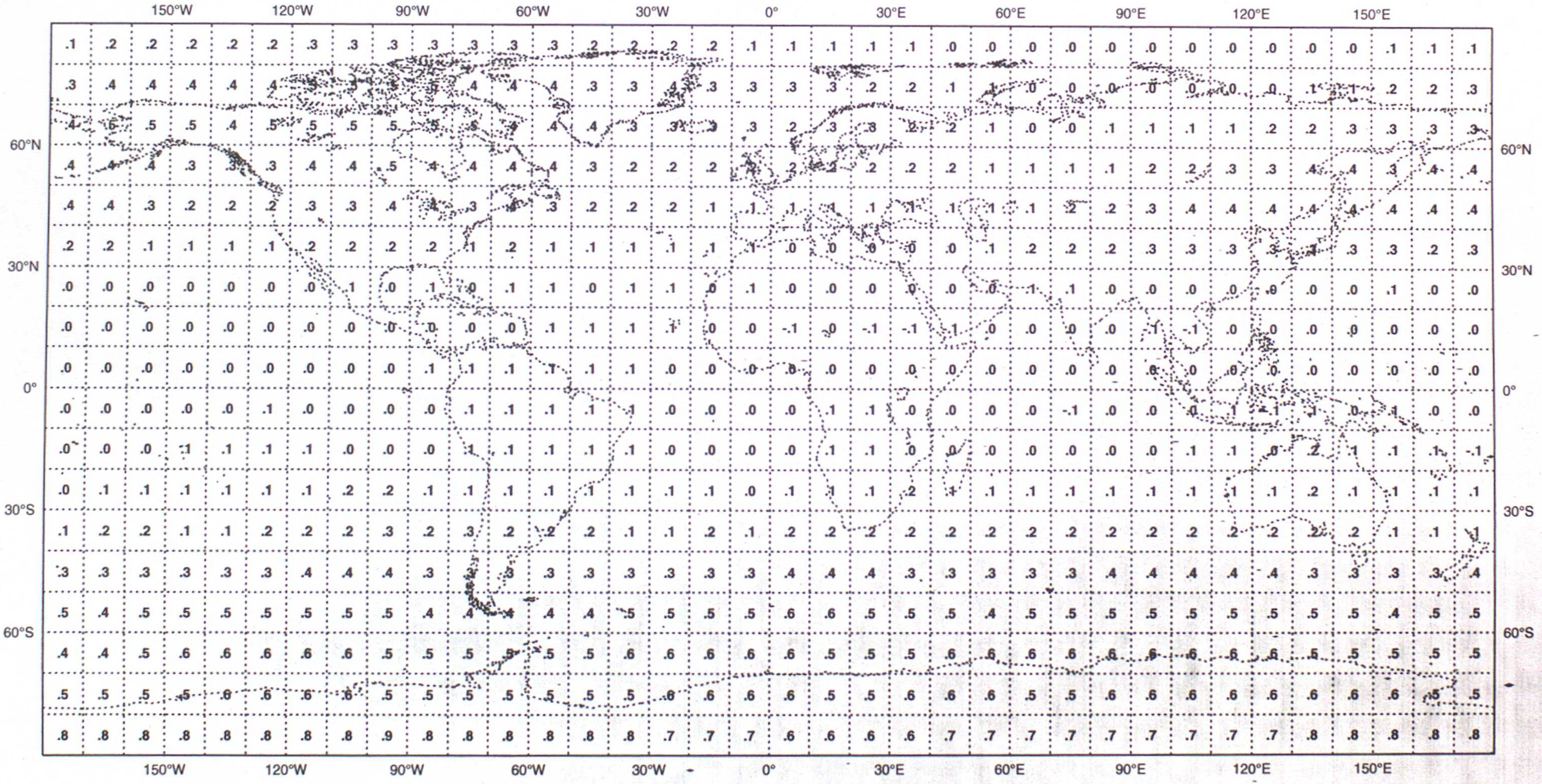

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

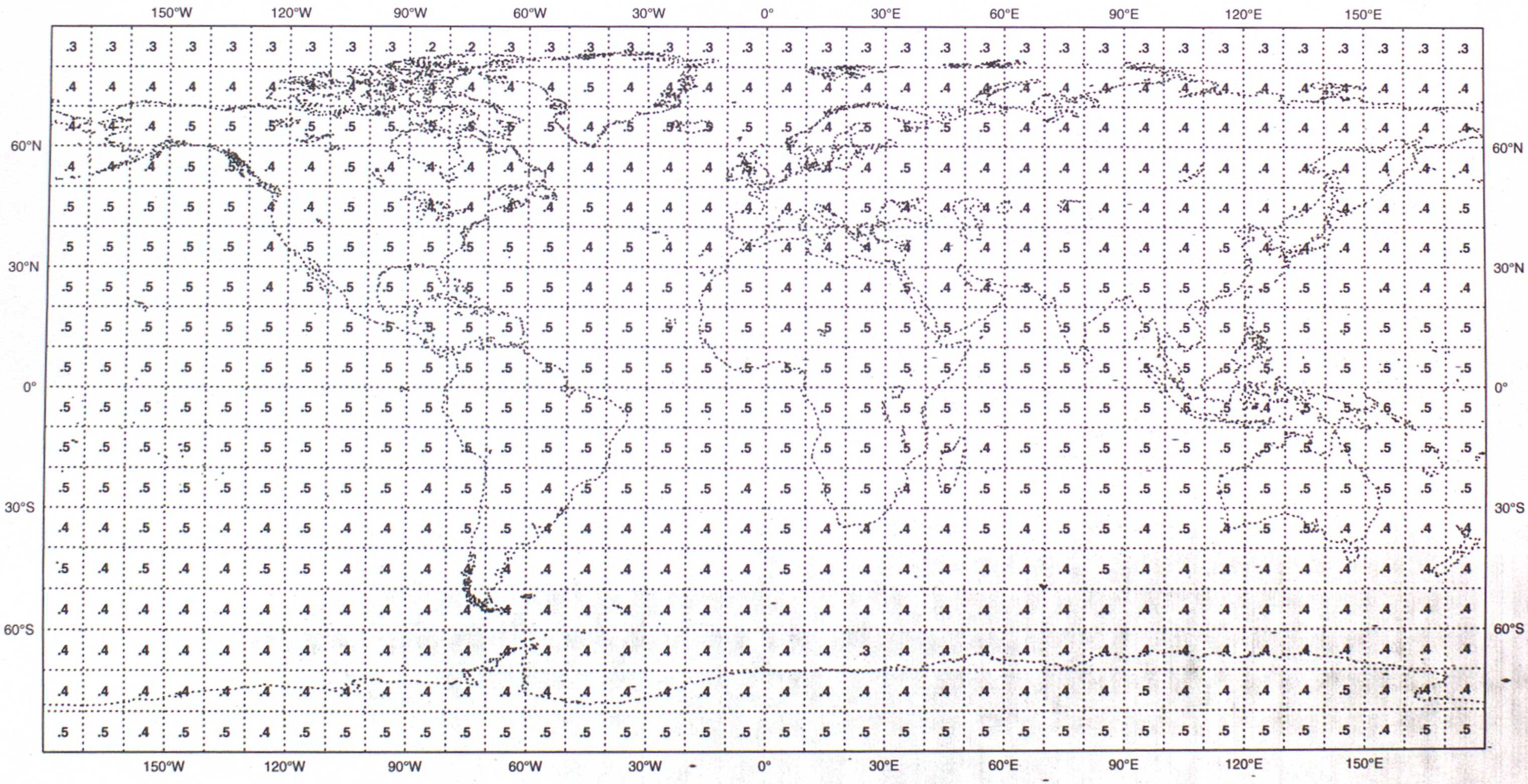

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

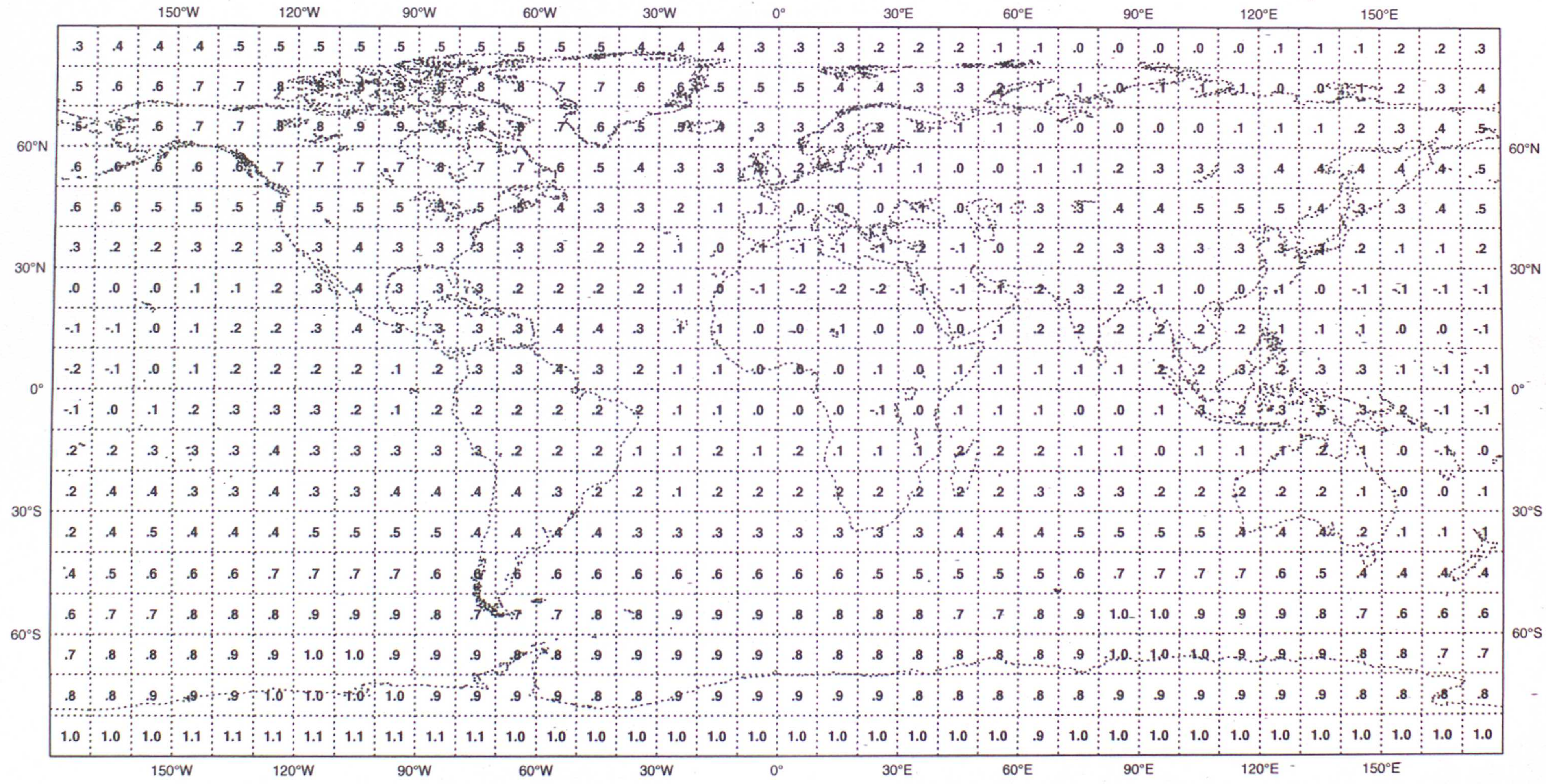

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.3 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .3 .3 .3 .2 .2 .2 .1 .1 .0 .0 .0 .0 .0 .1 .1 .1 .2 .2 .3
.5 .6 .6 .7 .7 .8 .8 .8 .9 .9 .8 .8 .7 .7 .6 .6 .5 .5 .5 .4 .4 .3 .3 .2 .1 .1 .0 -.1 -.1 .1 .0 .0 .1 .2 .3 .4
.5 .6 .6 .7 .7 .8 .8 .9 .9 .9 .8 .8 .7 .6 .5 .5 .4 .3 .3 .3 .2 .2 .1 .1 .0 .0 .0 .0 .0 .1 .1 .1 .2 .3 .4 .5
.6 .6 .6 .6 .6 .7 .7 .7 .7 .8 .7 .7 .6 .5 .4 .3 .3 .2 .2 .1 .1 .1 .0 .0 .1 .1 .2 .3 .3 .3 .4 .4 .4 .4 .4 .5
.6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .3 .3 .2 .1 .1 .0 .0 .0 .1 .0 .1 .3 .3 .4 .4 .5 .5 .5 .4 .3 .3 .4 .5
.3 .2 .2 .3 .2 .3 .3 .4 .3 .3 .3 .3 .3 .2 .2 .1 .0 -.1 -.1 -.1 -.1 -.2 -.1 .0 .2 .2 .3 .3 .3 .3 .3 .3 .2 .1 .1 .2
.0 .0 .0 .1 .1 .2 .3 .4 .3 .3 .3 .2 .2 .2 .2 .1 .0 -.1 -.2 -.2 -.2 -.1 -.1 .1 .2 .3 .2 .1 .0 .0 .1 .0 -.1 -.1 -.1 -.1
-.1 -.1 .0 .1 .2 .2 .3 .4 .3 .3 .3 .3 .4 .4 .3 .1 .1 .0 -.0 .1 .0 .0 .0 .1 .2 .2 .2 .2 .2 .2 .1 .1 .1 .0 .0 -.1
-.2 -.1 .0 .1 .2 .2 .2 .2 .1 .2 .3 .3 .4 .3 .2 .1 .1 .0 .0 .0 .1 .0 .1 .1 .1 .1 .1 .2 .2 .3 .2 .3 .3 .1 -.1 -.1
-.1 .0 .1 .2 .3 .3 .3 .2 .1 .2 .2 .2 .2 .2 .2 .1 .1 .0 .0 .0 -.1 .0 .1 .1 .1 .0 .0 .1 .3 .2 .3 .5 .3 .2 -.1 -.1
.2 .2 .3 .3 .3 .4 .3 .3 .3 .3 .3 .2 .2 .2 .1 .1 .2 .1 .2 .1 .1 .1 .2 .2 .2 .1 .1 .0 .1 .1 .1 .2 .1 .0 -.1 .0
.2 .4 .4 .3 .3 .4 .3 .3 .4 .4 .4 .4 .3 .2 .2 .1 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .2 .2 .2 .2 .2 .1 .0 .0 .1
.2 .4 .5 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .2 .1 .1 .1
.4 .5 .6 .6 .6 .7 .7 .7 .7 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .6 .7 .7 .7 .7 .6 .5 .4 .4 .4 .4
.6 .7 .7 .8 .8 .8 .9 .9 .9 .8 .7 .7 .7 .8 .8 .9 .9 .9 .8 .8 .8 .8 .7 .7 .8 .9 1.0 1.0 .9 .9 .9 .8 .7 .6 .6 .6
.7 .8 .8 .8 .9 .9 1.0 1.0 .9 .9 .9 .8 .8 .9 .9 .9 .9 .9 .8 .8 .8 .8 .8 .8 .8 .9 1.0 1.0 1.0 .9 .9 .9 .8 .8 .7 .7
.8 .8 .9 .9 .9 1.0 1.0 1.0 1.0 .9 .9 .9 .9 .8 .8 .9 .9 .9 .9 .9 .9 .8 .8 .8 .8 .8 .9 .9 .9 .9 .9 .9 .8 .8 .8 .8
1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 .9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

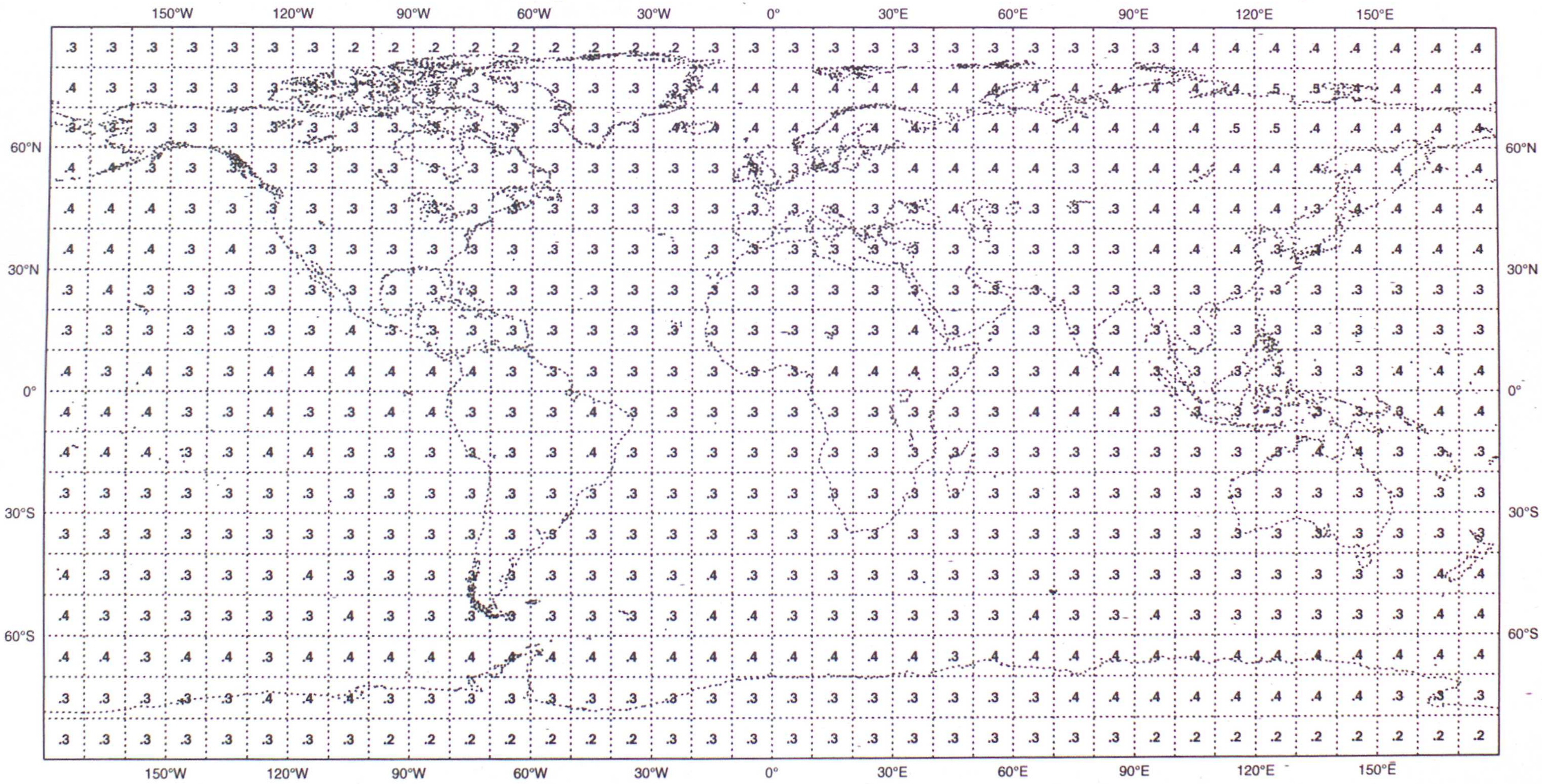
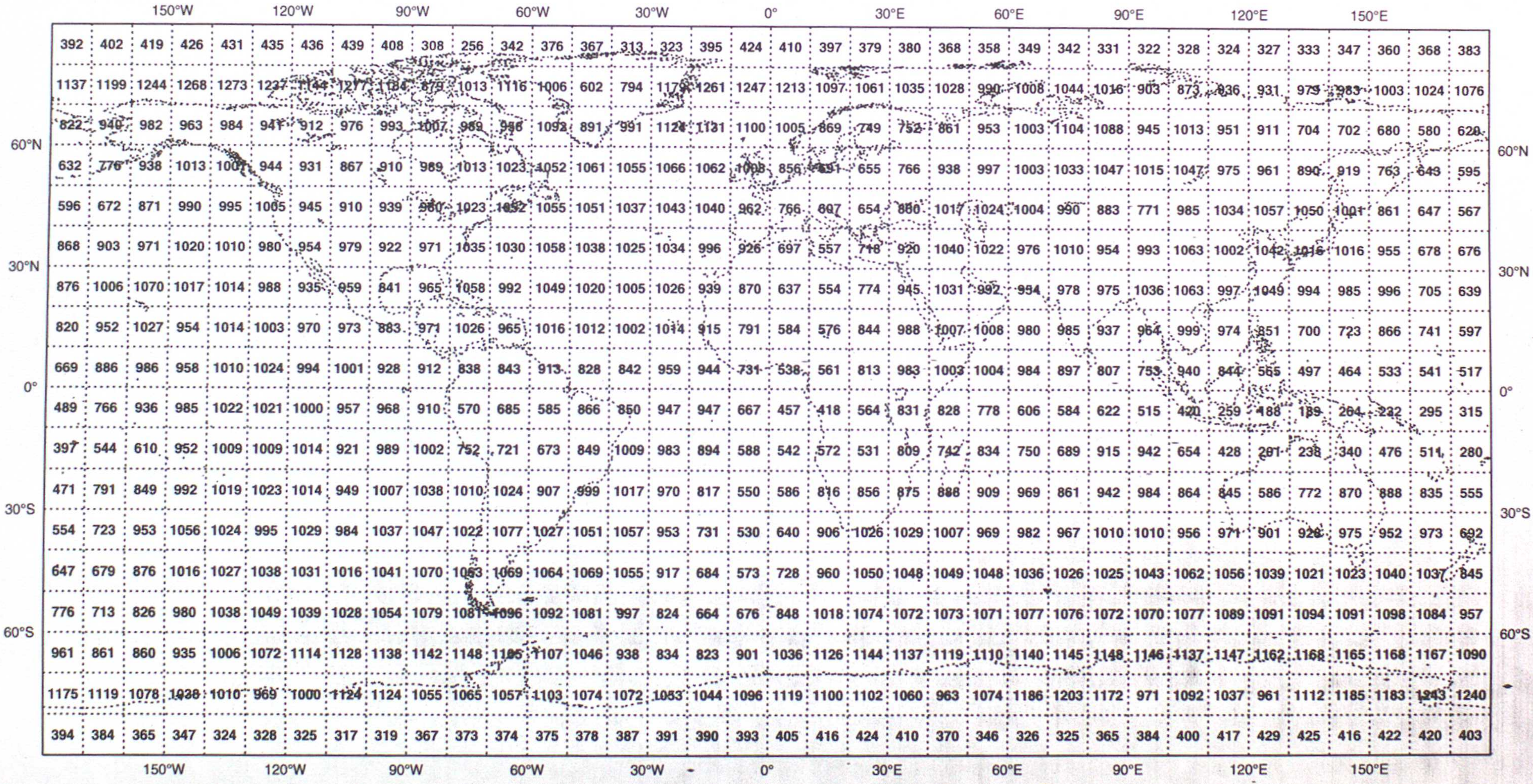

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 40. ATOVS mean daily count. FEBRUARY 2004
NOAA16, using all observations
Global average number of observations in 24 hours = 557715



392	402	419	426	431	435	436	439	408	308	256	342	376	367	313	323	395	424	410	397	379	380	368	358	349	342	331	322	328	324	327	333	347	360	368	383
1137	1199	1244	1268	1273	1237	1144	1277	1184	879	1013	1116	1006	602	794	1179	1261	1247	1213	1097	1061	1035	1028	990	1008	1044	1016	903	873	836	931	979	983	1003	1024	1076
822	940	982	963	984	941	912	976	993	1007	989	956	1092	891	991	1124	1131	1100	1005	869	749	752	861	953	1003	1104	1088	945	1013	951	911	704	702	680	580	620
632	776	938	1013	1001	944	931	867	910	989	1013	1023	1052	1061	1055	1066	1062	1008	856	691	655	766	938	997	1003	1033	1047	1015	1047	975	961	890	919	763	643	595
596	672	871	990	995	1005	945	910	939	980	1023	1052	1055	1051	1037	1043	1040	962	766	607	654	880	1017	1024	1004	990	883	771	985	1034	1057	1050	1001	861	647	567
868	903	971	1020	1010	980	954	979	922	971	1035	1030	1058	1038	1025	1034	996	926	697	557	718	920	1040	1022	976	1010	954	993	1063	1002	1042	1016	1016	955	678	676
876	1006	1070	1017	1014	988	935	959	841	965	1058	992	1049	1020	1005	1026	939	870	637	554	774	945	1031	992	954	978	975	1036	1063	997	1049	994	985	996	705	639
820	952	1027	954	1014	1003	970	973	883	971	1026	965	1016	1012	1002	1014	915	791	584	576	844	988	1007	1008	980	985	937	964	999	974	851	700	723	866	741	597
669	886	986	958	1010	1024	994	1001	928	912	838	843	913	828	842	959	944	731	538	561	813	983	1003	1004	984	897	807	753	940	844	565	497	464	533	541	517
489	766	936	985	1022	1021	1000	957	968	910	570	685	585	866	850	947	947	667	457	418	564	831	828	778	606	584	622	515	420	259	488	189	264	232	295	315
397	544	610	952	1009	1009	1014	921	989	1002	752	721	673	849	1009	983	894	588	542	572	531	809	742	834	750	689	915	942	654	428	281	238	340	476	511	280
471	791	849	992	1019	1023	1014	949	1007	1038	1010	1024	907	999	1017	970	817	550	586	816	856	875	888	909	969	861	942	984	864	845	586	772	870	888	835	555
554	723	953	1056	1024	995	1029	984	1037	1047	1022	1077	1027	1051	1057	953	731	530	640	906	1026	1029	1007	969	982	967	1010	1010	956	971	901	926	975	952	973	692
647	679	876	1016	1027	1038	1031	1016	1041	1070	1063	1069	1064	1069	1055	917	684	573	728	960	1050	1048	1049	1048	1036	1026	1025	1043	1062	1056	1039	1021	1023	1040	1037	845
776	713	826	980	1038	1049	1039	1028	1054	1079	1081	1096	1092	1081	997	824	664	676	848	1018	1074	1072	1073	1071	1077	1076	1072	1070	1077	1089	1091	1094	1091	1098	1084	957
961	861	860	935	1006	1072	1114	1128	1138	1142	1148	1185	1107	1046	938	834	823	901	1036	1126	1144	1137	1119	1110	1140	1145	1148	1146	1137	1147	1162	1168	1165	1168	1167	1090
1175	1119	1078	1038	1010	969	1000	1124	1124	1055	1065	1057	1103	1074	1072	1053	1044	1096	1119	1100	1102	1060	963	1074	1186	1203	1172	971	1092	1037	961	1112	1185	1183	1243	1240
394	384	365	347	324	328	325	317	319	367	373	374	375	378	387	391	390	393	405	416	424	410	370	346	326	325	365	384	400	417	429	425	416	422	420	403

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations

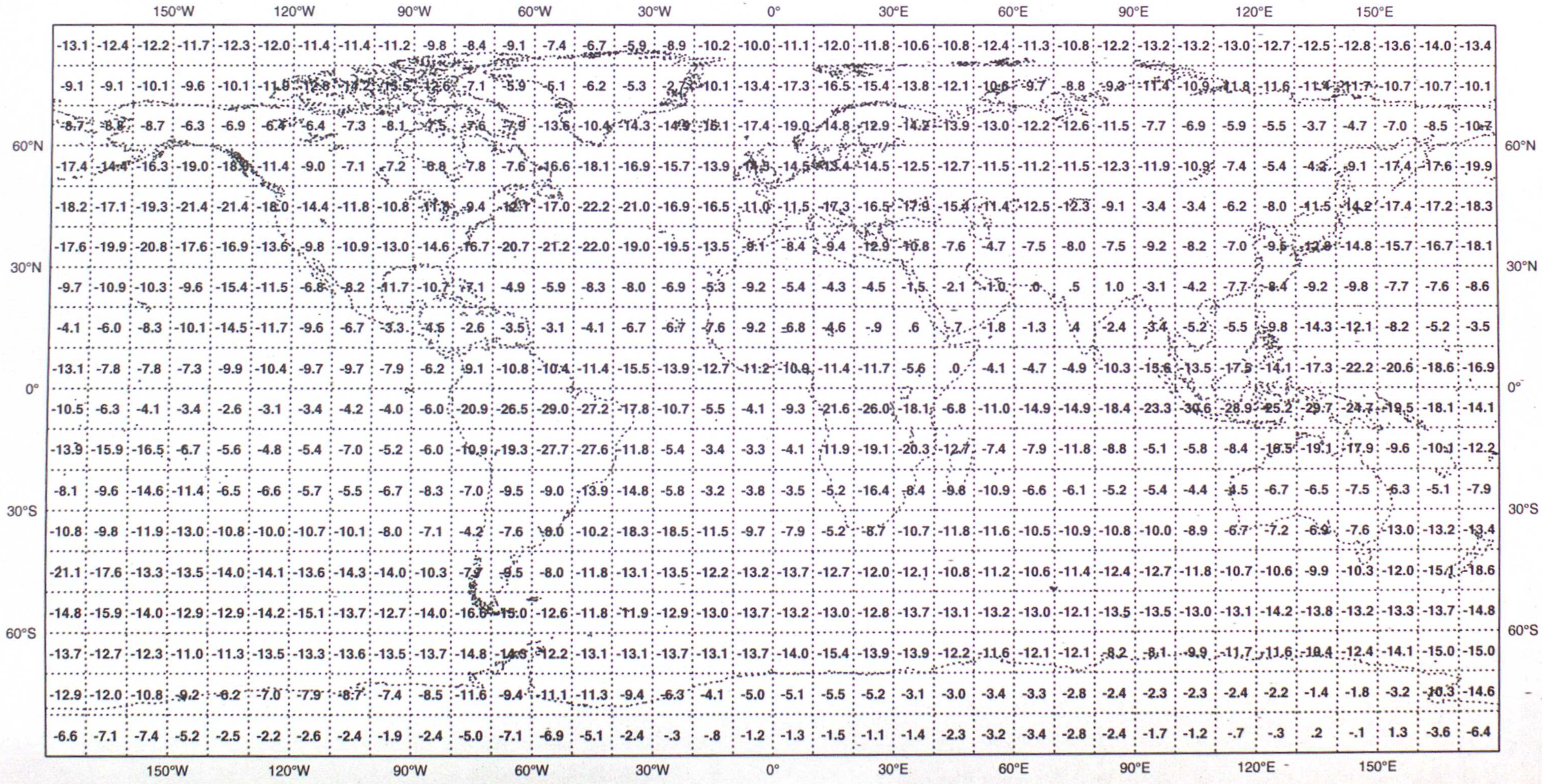
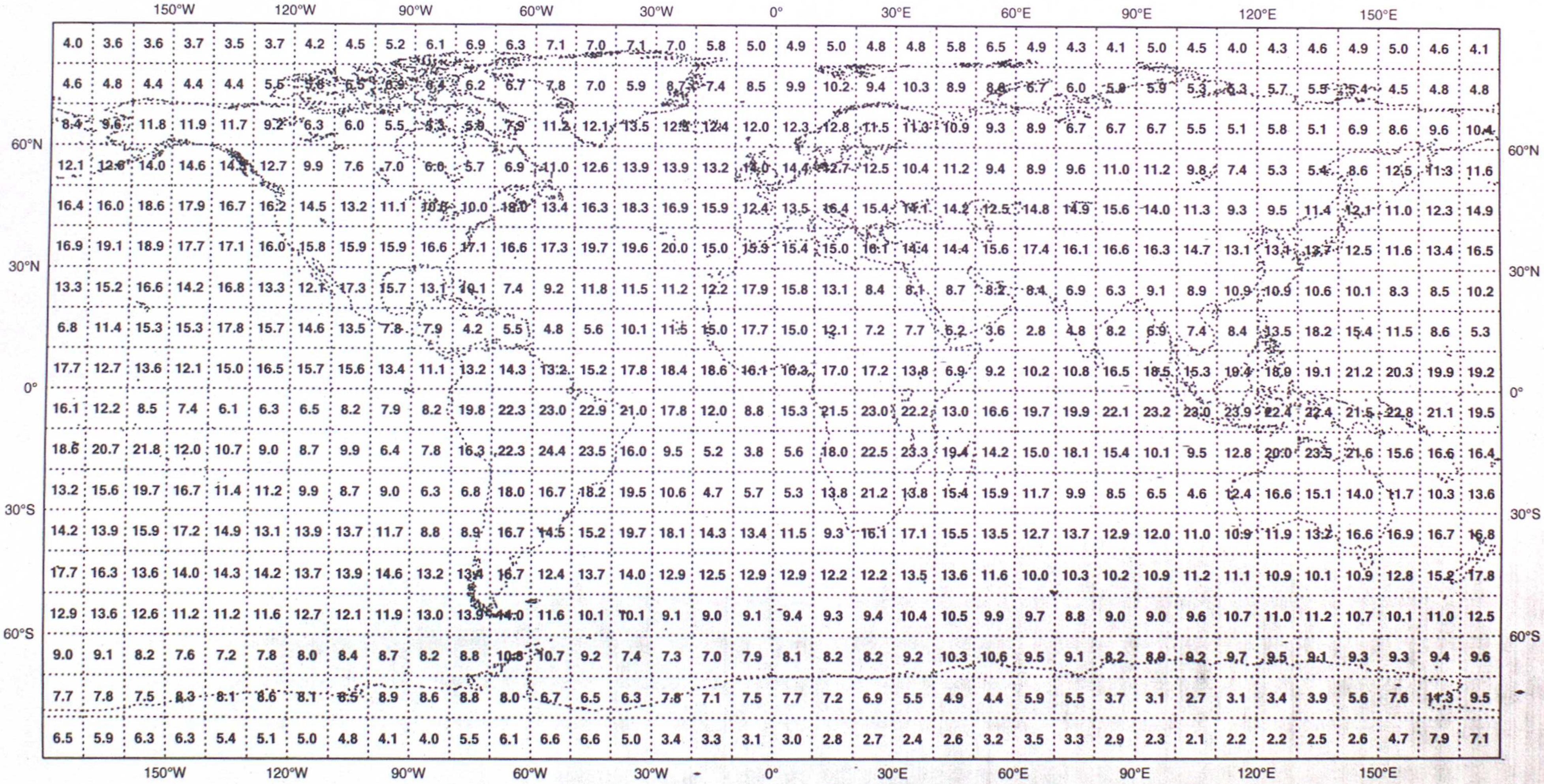
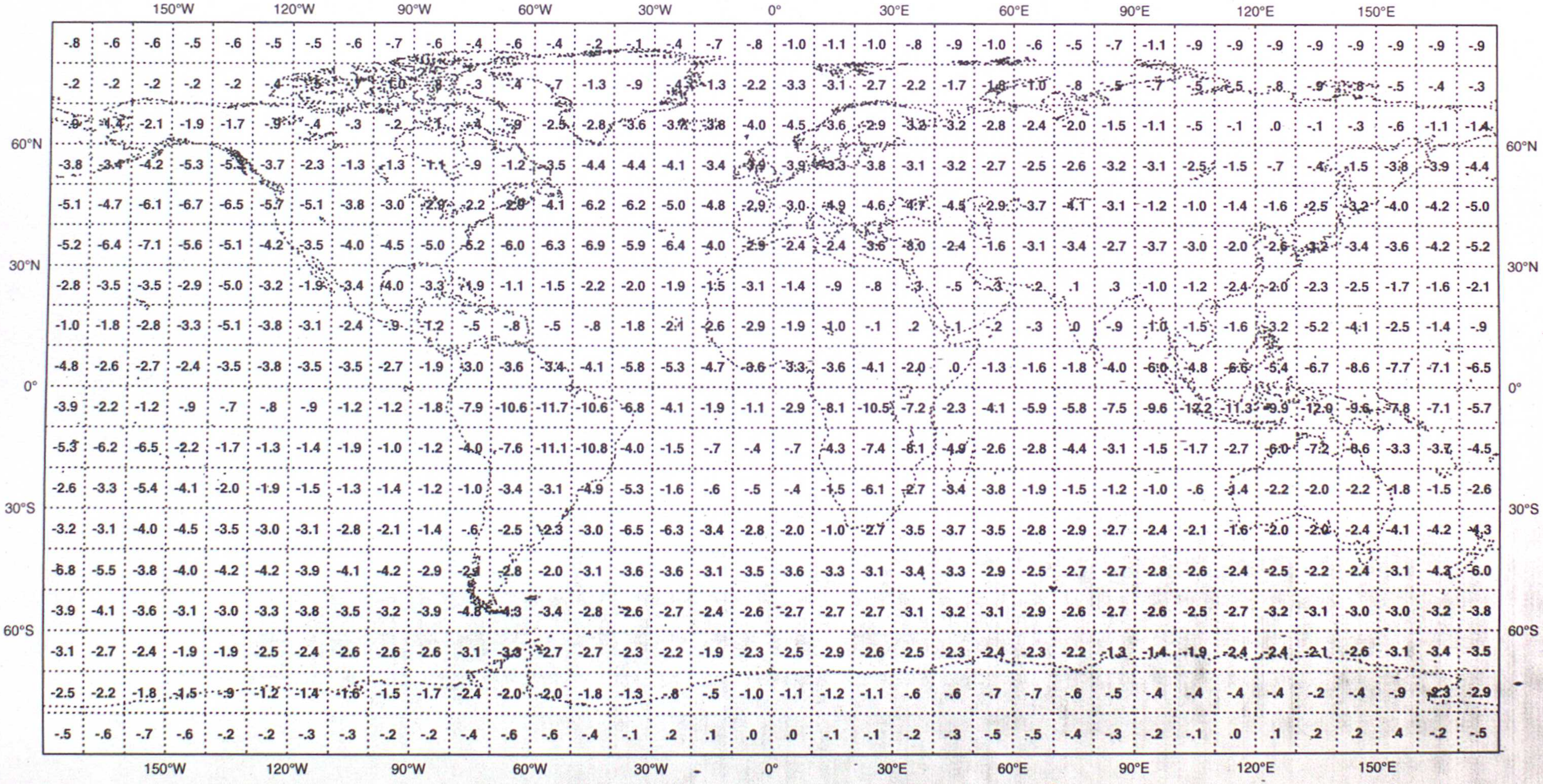

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-13.1 -12.4 -12.2 -11.7 -12.3 -12.0 -11.4 -11.4 -11.2 -9.8 -8.4 -9.1 -7.4 -6.7 -5.9 -8.9 -10.2 -10.0 -11.1 -12.0 -11.8 -10.6 -10.8 -12.4 -11.3 -10.8 -12.2 -13.2 -13.2 -13.0 -12.7 -12.5 -12.8 -13.6 -14.0 -13.4
-9.1 -9.1 -10.1 -9.6 -10.1 -11.8 -12.8 -14.2 -15.5 -12.6 -7.1 -5.9 -5.1 -6.2 -5.3 -2.7 -10.1 -13.4 -17.3 -16.5 -15.4 -13.8 -12.1 -10.6 -9.7 -8.8 -9.3 -11.4 -10.9 -11.8 -11.6 -11.4 -11.7 -10.7 -10.7 -10.1
-8.7 -8.8 -8.7 -6.3 -6.9 -6.4 -6.4 -7.3 -8.1 -7.5 -7.6 -7.9 -13.6 -10.4 -14.3 -14.9 -15.1 -17.4 -19.0 -14.8 -12.9 -14.2 -13.9 -13.0 -12.2 -12.6 -11.5 -7.7 -6.9 -5.9 -5.5 -3.7 -4.7 -7.0 -8.5 -10.7
-17.4 -14.4 -16.3 -19.0 -18.9 -11.4 -9.0 -7.1 -7.2 -6.8 -7.8 -7.6 -16.6 -18.1 -16.9 -15.7 -13.9 -14.5 -14.5 -13.4 -14.5 -12.5 -12.7 -11.5 -11.2 -11.5 -12.3 -11.9 -10.9 -7.4 -5.4 -4.2 -9.1 -17.4 -17.6 -19.9
-18.2 -17.1 -19.3 -21.4 -21.4 -18.0 -14.4 -11.8 -10.8 -11.8 -9.4 -12.1 -17.0 -22.2 -21.0 -16.9 -16.5 -11.0 -11.5 -17.3 -16.5 -17.9 -15.4 -11.4 -12.5 -12.3 -9.1 -3.4 -3.4 -6.2 -8.0 -11.5 -14.2 -17.4 -17.2 -18.3
-17.6 -19.9 -20.8 -17.6 -16.9 -13.6 -9.8 -10.9 -13.0 -14.6 -16.7 -20.7 -21.2 -22.0 -19.0 -19.5 -13.5 -8.1 -8.4 -9.4 -12.9 -10.8 -7.6 -4.7 -7.5 -8.0 -7.5 -9.2 -8.2 -7.0 -9.5 -12.8 -14.8 -15.7 -16.7 -18.1
-9.7 -10.9 -10.3 -9.6 -15.4 -11.5 -6.8 -8.2 -11.7 -10.7 -7.1 -4.9 -5.9 -8.3 -8.0 -6.9 -5.3 -9.2 -5.4 -4.3 -4.5 -1.5 -2.1 -1.0 .0 .5 1.0 -3.1 -4.2 -7.7 -8.4 -9.2 -9.8 -7.7 -7.6 -8.6
-4.1 -6.0 -8.3 -10.1 -14.5 -11.7 -9.6 -6.7 -3.3 -4.5 -2.6 -3.5 -3.1 -4.1 -6.7 -6.7 -7.6 -9.2 -6.8 -4.6 -.9 .6 .7 -1.8 -1.3 .4 -2.4 -3.4 -5.2 -5.5 -9.8 -14.3 -12.1 -8.2 -5.2 -3.5
-13.1 -7.8 -7.8 -7.3 -9.9 -10.4 -9.7 -9.7 -7.9 -6.2 -9.1 -10.8 -10.4 -11.4 -15.5 -13.9 -12.7 -11.2 -10.8 -11.4 -11.7 -5.6 .0 -4.1 -4.7 -4.9 -10.3 -15.6 -13.5 -17.5 -14.1 -17.3 -22.2 -20.6 -18.6 -16.9
-10.5 -6.3 -4.1 -3.4 -2.6 -3.1 -3.4 -4.2 -4.0 -6.0 -20.9 -26.5 -29.0 -27.2 -17.8 -10.7 -5.5 -4.1 -9.3 -21.6 -26.0 -18.1 -6.8 -11.0 -14.9 -14.9 -18.4 -23.3 -30.6 -28.9 -25.2 -29.7 -24.7 -19.5 -18.1 -14.1
-13.9 -15.9 -16.5 -6.7 -5.6 -4.8 -5.4 -7.0 -5.2 -6.0 -10.9 -19.3 -27.7 -27.6 -11.8 -5.4 -3.4 -3.3 -4.1 -11.9 -19.1 -20.3 -12.7 -7.4 -7.9 -11.8 -8.8 -5.1 -5.8 -8.4 -18.5 -19.1 -17.9 -9.6 -10.1 -12.2
-8.1 -9.6 -14.6 -11.4 -6.5 -6.6 -5.7 -5.5 -6.7 -8.3 -7.0 -9.5 -9.0 -13.9 -14.8 -5.8 -3.2 -3.8 -3.5 -5.2 -16.4 -8.4 -9.8 -10.9 -6.6 -6.1 -5.2 -5.4 -4.4 -4.5 -6.7 -6.5 -7.5 -6.3 -5.1 -7.9
-10.8 -9.8 -11.9 -13.0 -10.8 -10.0 -10.7 -10.1 -8.0 -7.1 -4.2 -7.6 -8.0 -10.2 -18.3 -18.5 -11.5 -9.7 -7.9 -5.2 -8.7 -10.7 -11.8 -11.6 -10.5 -10.9 -10.8 -10.0 -8.9 -6.7 -7.2 -6.9 -7.6 -13.0 -13.2 -13.4
-21.1 -17.6 -13.3 -13.5 -14.0 -14.1 -13.6 -14.3 -14.0 -10.3 -7.7 -9.5 -8.0 -11.8 -13.1 -13.5 -12.2 -13.2 -13.7 -12.7 -12.0 -12.1 -10.8 -11.2 -10.6 -11.4 -12.4 -12.7 -11.8 -10.7 -10.6 -9.9 -10.3 -12.0 -15.1 -18.6
-14.8 -15.9 -14.0 -12.9 -12.9 -14.2 -15.1 -13.7 -12.7 -14.0 -16.6 -15.0 -12.6 -11.8 -11.9 -12.9 -13.0 -13.7 -13.2 -13.0 -12.8 -13.7 -13.1 -13.2 -13.0 -12.1 -13.5 -13.5 -13.0 -13.1 -14.2 -13.8 -13.2 -13.3 -13.7 -14.8
-13.7 -12.7 -12.3 -11.0 -11.3 -13.5 -13.3 -13.6 -13.5 -13.7 -14.8 -14.8 -12.2 -13.1 -13.1 -13.7 -13.1 -13.7 -14.0 -15.4 -13.9 -13.9 -12.2 -11.6 -12.1 -12.1 -8.2 -8.1 -9.9 -11.7 -11.6 -10.4 -12.4 -14.1 -15.0 -15.0
-12.9 -12.0 -10.8 -9.2 -6.2 -7.0 -7.9 -8.7 -7.4 -8.5 -11.6 -9.4 -11.1 -11.3 -9.4 -6.3 -4.1 -5.0 -5.1 -5.5 -5.2 -3.1 -3.0 -3.4 -3.3 -2.8 -2.4 -2.3 -2.3 -2.4 -2.2 -1.4 -1.8 -3.2 -10.3 -14.6
-6.6 -7.1 -7.4 -5.2 -2.5 -2.2 -2.6 -2.4 -1.9 -2.4 -5.0 -7.1 -6.9 -5.1 -2.4 -.3 -.8 -1.2 -1.3 -1.5 -1.1 -1.4 -2.3 -3.2 -3.4 -2.8 -2.4 -1.7 -1.2 -.7 -.3 .2 -.1 1.3 -3.6 -6.4

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations



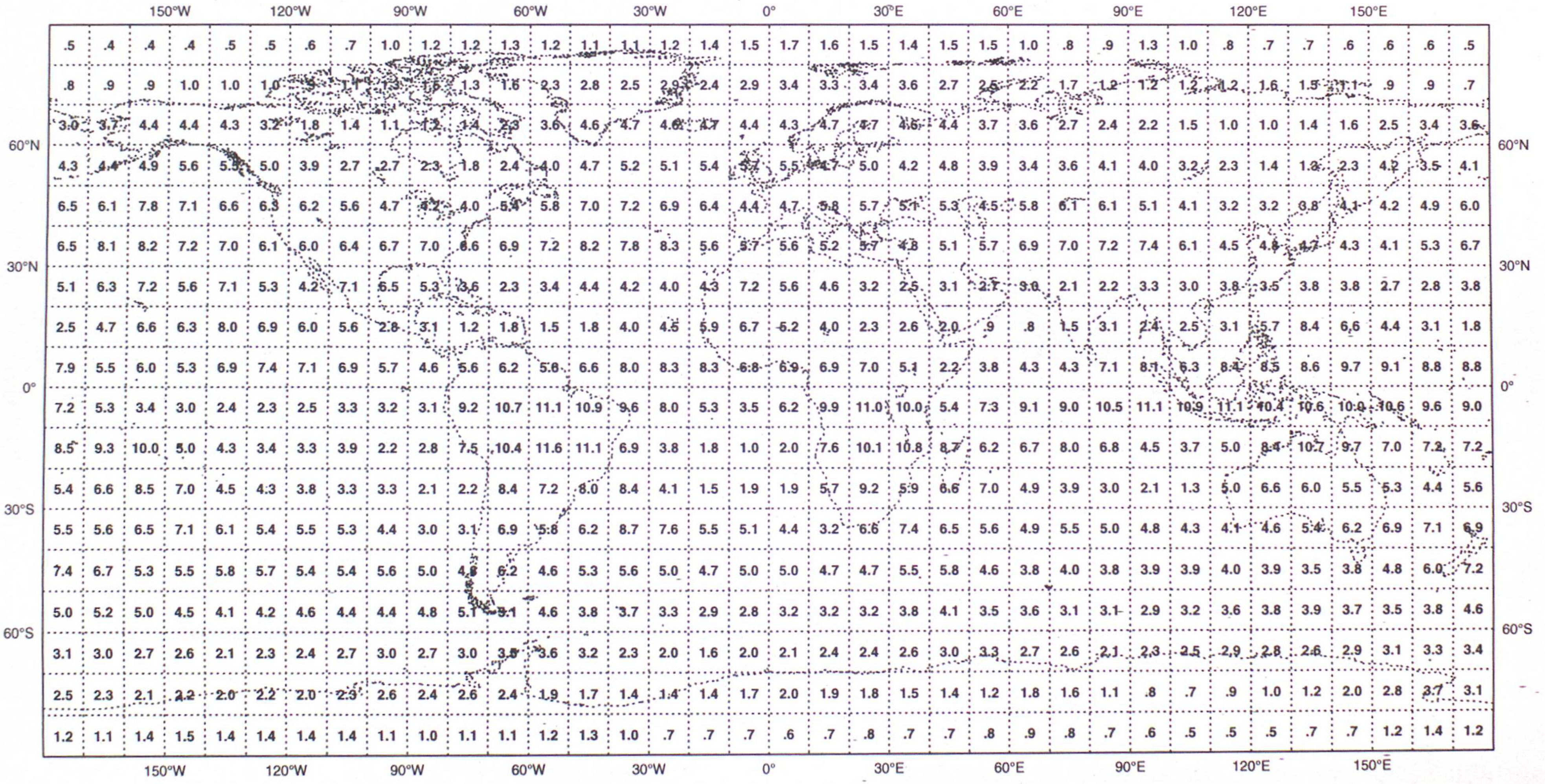
4.0	3.6	3.6	3.7	3.5	3.7	4.2	4.5	5.2	6.1	6.9	6.3	7.1	7.0	7.1	7.0	5.8	5.0	4.9	5.0	4.8	4.8	5.8	6.5	4.9	4.3	4.1	5.0	4.5	4.0	4.3	4.6	4.9	5.0	4.6	4.1
4.6	4.8	4.4	4.4	4.4	5.5	5.8	6.5	6.9	6.4	6.2	6.7	7.8	7.0	5.9	8.7	7.4	8.5	9.9	10.2	9.4	10.3	8.9	8.8	6.7	6.0	5.8	5.9	5.3	6.3	5.7	5.5	5.4	4.5	4.8	4.8
8.4	9.6	11.8	11.9	11.7	9.2	6.3	6.0	5.5	5.3	5.8	7.9	11.2	12.1	13.5	12.8	12.4	12.0	12.3	12.8	11.5	11.3	10.9	9.3	8.9	6.7	6.7	6.7	5.5	5.1	5.8	5.1	6.9	8.6	9.6	10.4
12.1	12.6	14.0	14.6	14.5	12.7	9.9	7.6	7.0	6.6	5.7	6.9	11.0	12.6	13.9	13.9	13.2	14.0	14.4	12.7	12.5	10.4	11.2	9.4	8.9	9.6	11.0	11.2	9.8	7.4	5.3	5.4	8.6	12.5	11.3	11.6
16.4	16.0	18.6	17.9	16.7	16.2	14.5	13.2	11.1	10.6	10.0	18.0	13.4	16.3	18.3	16.9	15.9	12.4	13.5	16.4	15.4	14.1	14.2	12.5	14.8	14.9	15.6	14.0	11.3	9.3	9.5	11.4	12.1	11.0	12.3	14.9
16.9	19.1	18.9	17.7	17.1	16.0	15.8	15.9	15.9	16.6	17.1	16.6	17.3	19.7	19.6	20.0	15.0	15.9	15.4	15.0	16.1	14.4	14.4	15.6	17.4	16.1	16.6	16.3	14.7	13.1	13.1	13.7	12.5	11.6	13.4	16.5
13.3	15.2	16.6	14.2	16.8	13.3	12.1	17.3	15.7	13.1	10.1	7.4	9.2	11.8	11.5	11.2	12.2	17.9	15.8	13.1	8.4	8.1	8.7	8.2	8.4	6.9	6.3	9.1	8.9	10.9	10.9	10.6	10.1	8.3	8.5	10.2
6.8	11.4	15.3	15.3	17.8	15.7	14.6	13.5	7.8	7.9	4.2	5.5	4.8	5.6	10.1	11.5	15.0	17.7	15.0	12.1	7.2	7.7	6.2	3.6	2.8	4.8	8.2	6.9	7.4	8.4	13.5	18.2	15.4	11.5	8.6	5.3
17.7	12.7	13.6	12.1	15.0	16.5	15.7	15.6	13.4	11.1	13.2	14.3	13.2	15.2	17.8	18.4	18.6	16.1	16.3	17.0	17.2	13.8	6.9	9.2	10.2	10.8	16.5	18.5	15.3	19.4	18.9	19.1	21.2	20.3	19.9	19.2
16.1	12.2	8.5	7.4	6.1	6.3	6.5	8.2	7.9	8.2	19.8	22.3	23.0	22.9	21.0	17.8	12.0	8.8	15.3	21.5	23.0	22.2	13.0	16.6	19.7	19.9	22.1	23.2	23.0	23.9	22.4	22.4	21.5	22.8	21.1	19.5
18.6	20.7	21.8	12.0	10.7	9.0	8.7	9.9	6.4	7.8	16.3	22.3	24.4	23.5	16.0	9.5	5.2	3.8	5.6	18.0	22.5	23.3	19.4	14.2	15.0	18.1	15.4	10.1	9.5	12.8	20.0	23.5	21.6	15.6	16.6	16.4
13.2	15.6	19.7	16.7	11.4	11.2	9.9	8.7	9.0	6.3	6.8	18.0	16.7	18.2	19.5	10.6	4.7	5.7	5.3	13.8	21.2	13.8	15.4	15.9	11.7	9.9	8.5	6.5	4.6	12.4	16.6	15.1	14.0	11.7	10.3	13.6
14.2	13.9	15.9	17.2	14.9	13.1	13.9	13.7	11.7	8.8	8.9	16.7	14.5	15.2	19.7	18.1	14.3	13.4	11.5	9.3	16.1	17.1	15.5	13.5	12.7	13.7	12.9	12.0	11.0	10.9	11.9	13.2	16.6	16.9	16.7	16.8
17.7	16.3	13.6	14.0	14.3	14.2	13.7	13.9	14.6	13.2	13.4	16.7	12.4	13.7	14.0	12.9	12.5	12.9	12.9	12.2	12.2	13.5	13.6	11.6	10.0	10.3	10.2	10.9	11.2	11.1	10.9	10.1	10.9	12.8	15.2	17.8
12.9	13.6	12.6	11.2	11.2	11.6	12.7	12.1	11.9	13.0	13.9	14.0	11.6	10.1	10.1	9.1	9.0	9.1	9.4	9.3	9.4	10.4	10.5	9.9	9.7	8.8	9.0	9.0	9.6	10.7	11.0	11.2	10.7	10.1	11.0	12.5
9.0	9.1	8.2	7.6	7.2	7.8	8.0	8.4	8.7	8.2	8.8	10.8	10.7	9.2	7.4	7.3	7.0	7.9	8.1	8.2	8.2	9.2	10.3	10.6	9.5	9.1	8.2	8.9	9.2	9.7	9.5	9.1	9.3	9.3	9.4	9.6
7.7	7.8	7.5	8.3	8.1	8.6	8.1	8.5	8.9	8.6	8.8	8.0	6.7	6.5	6.3	7.8	7.1	7.5	7.7	7.2	6.9	5.5	4.9	4.4	5.9	5.5	3.7	3.1	2.7	3.1	3.4	3.9	5.6	7.6	11.3	9.5
6.5	5.9	6.3	6.3	5.4	5.1	5.0	4.8	4.1	4.0	5.5	6.1	6.6	6.6	5.0	3.4	3.3	3.1	3.0	2.8	2.7	2.4	2.6	3.2	3.5	3.3	2.9	2.3	2.1	2.2	2.2	2.5	2.6	4.7	7.9	7.1

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



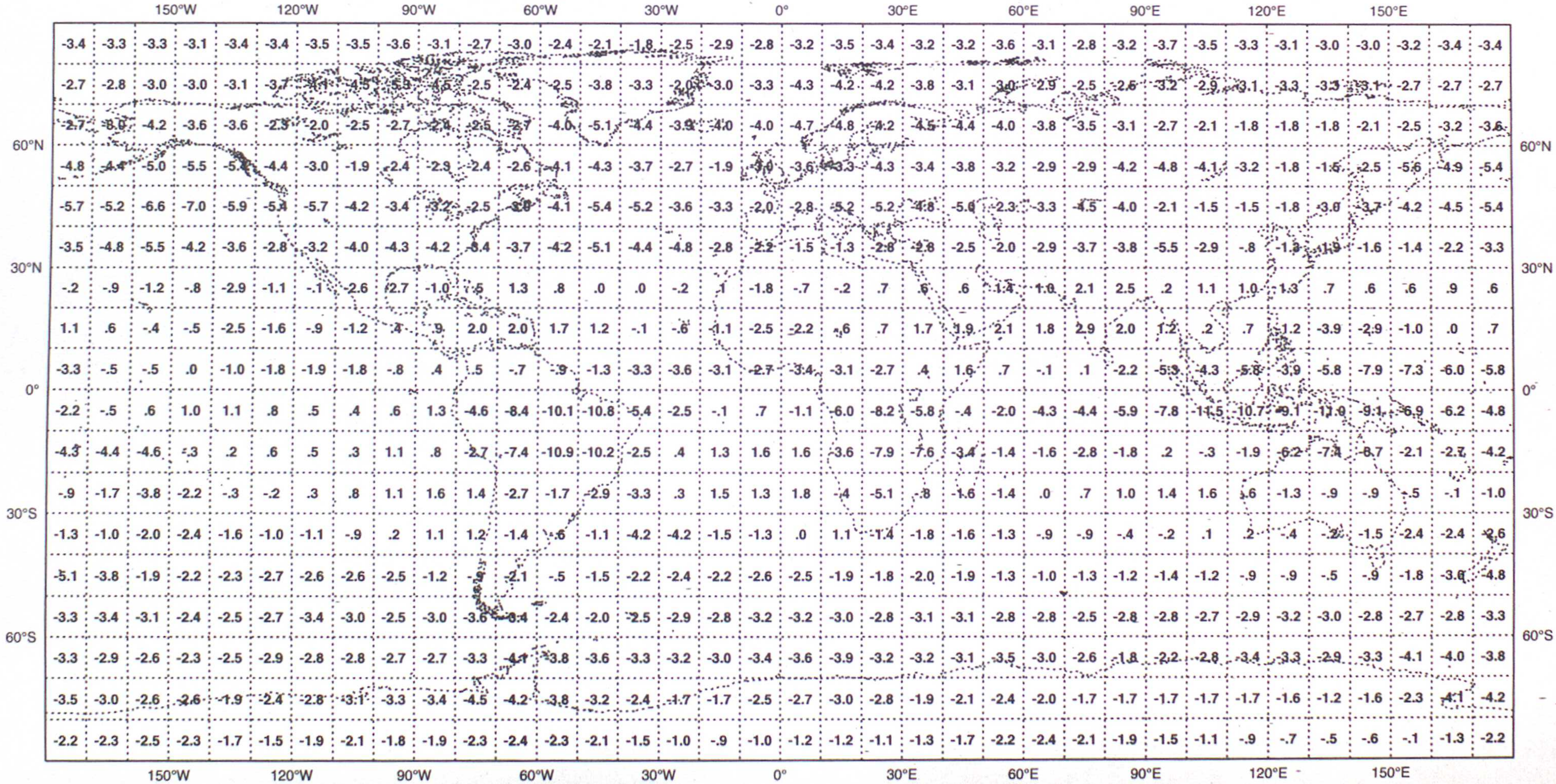
-.8	-.6	-.6	-.5	-.6	-.5	-.5	-.6	-.7	-.6	-.4	-.6	-.4	-.2	-.1	-.4	-.7	-.8	-1.0	-1.1	-1.0	-.8	-.9	-1.0	-.6	-.5	-.7	-1.1	-.9	-.9	-.9	-.9	-.9	-.9	-.9	-.9
-.2	-.2	-.2	-.2	-.2	-.4	-.5	-.7	-1.0	-.8	-.3	-.4	-.7	-1.3	-.9	-.4	-1.3	-2.2	-3.3	-3.1	-2.7	-2.2	-1.7	-1.8	-1.0	-.8	-.5	-.7	-.5	-.5	-.8	-.9	-.8	-.5	-.4	-.3
-.9	-1.4	-2.1	-1.9	-1.7	-.9	-.4	-.3	-.2	-.1	-.4	-.9	-2.5	-2.8	-3.6	-3.7	-3.8	-4.0	-4.5	-3.6	-2.9	-3.2	-3.2	-2.8	-2.4	-2.0	-1.5	-1.1	-.5	-.1	.0	-.1	-.3	-.6	-1.1	-1.4
-3.8	-3.4	-4.2	-5.3	-5.3	-3.7	-2.3	-1.3	-1.3	-1.1	-.9	-1.2	-3.5	-4.4	-4.4	-4.1	-3.4	-3.9	-3.9	-3.3	-3.8	-3.1	-3.2	-2.7	-2.5	-2.6	-3.2	-3.1	-2.5	-1.5	-.7	-.4	-1.5	-3.8	-3.9	-4.4
-5.1	-4.7	-6.1	-6.7	-6.5	-5.7	-5.1	-3.8	-3.0	-2.9	-2.2	-2.8	-4.1	-6.2	-6.2	-5.0	-4.8	-2.9	-3.0	-4.9	-4.6	-4.7	-4.5	-2.9	-3.7	-4.1	-3.1	-1.2	-1.0	-1.4	-1.6	-2.5	-3.2	-4.0	-4.2	-5.0
-5.2	-6.4	-7.1	-5.6	-5.1	-4.2	-3.5	-4.0	-4.5	-5.0	-5.2	-6.0	-6.3	-6.9	-5.9	-6.4	-4.0	-2.9	-2.4	-2.4	-3.6	-3.0	-2.4	-1.6	-3.1	-3.4	-2.7	-3.7	-3.0	-2.0	-2.6	-3.2	-3.4	-3.6	-4.2	-5.2
-2.8	-3.5	-3.5	-2.9	-5.0	-3.2	-1.9	-3.4	-4.0	-3.3	-1.9	-1.1	-1.5	-2.2	-2.0	-1.9	-1.5	-3.1	-1.4	-.9	-.8	-.3	-.5	-.3	-.2	.1	.3	-1.0	-1.2	-2.4	-2.0	-2.3	-2.5	-1.7	-1.6	-2.1
-1.0	-1.8	-2.8	-3.3	-5.1	-3.8	-3.1	-2.4	-.9	-1.2	-.5	-.8	-.5	-.8	-1.8	-2.1	-2.6	-2.9	-1.9	-1.0	-.1	.2	-.1	-.2	-.3	.0	-.9	-1.0	-1.5	-1.6	-3.2	-5.2	-4.1	-2.5	-1.4	-.9
-4.8	-2.6	-2.7	-2.4	-3.5	-3.8	-3.5	-3.5	-2.7	-1.9	-3.0	-3.6	-3.4	-4.1	-5.8	-5.3	-4.7	-3.6	-3.3	-3.6	-4.1	-2.0	.0	-1.3	-1.6	-1.8	-4.0	-6.0	-4.8	-6.6	-5.4	-6.7	-8.6	-7.7	-7.1	-6.5
-3.9	-2.2	-1.2	-.9	-.7	-.8	-.9	-1.2	-1.2	-1.8	-7.9	-10.6	-11.7	-10.6	-6.8	-4.1	-1.9	-1.1	-2.9	-8.1	-10.5	-7.2	-2.3	-4.1	-5.9	-5.8	-7.5	-9.6	-12.2	-11.3	-9.9	-12.0	-9.6	-7.8	-7.1	-5.7
-5.3	-6.2	-6.5	-2.2	-1.7	-1.3	-1.4	-1.9	-1.0	-1.2	-4.0	-7.6	-11.1	-10.8	-4.0	-1.5	-.7	-.4	-.7	-4.3	-7.4	-6.1	-4.9	-2.6	-2.8	-4.4	-3.1	-1.5	-1.7	-2.7	-6.0	-7.2	-8.6	-3.3	-3.7	-4.5
-2.6	-3.3	-5.4	-4.1	-2.0	-1.9	-1.5	-1.3	-1.4	-1.2	-1.0	-3.4	-3.1	-4.9	-5.3	-1.6	-.6	-.5	-.4	-1.5	-6.1	-2.7	-3.4	-3.8	-1.9	-1.5	-1.2	-1.0	-.6	-1.4	-2.2	-2.0	-2.2	-1.8	-1.5	-2.6
-3.2	-3.1	-4.0	-4.5	-3.5	-3.0	-3.1	-2.8	-2.1	-1.4	-.6	-2.5	-2.3	-3.0	-6.5	-6.3	-3.4	-2.8	-2.0	-1.0	-2.7	-3.5	-3.7	-3.5	-2.8	-2.9	-2.7	-2.4	-2.1	-1.6	-2.0	-2.0	-2.4	-4.1	-4.2	-4.3
-6.8	-5.5	-3.8	-4.0	-4.2	-4.2	-3.9	-4.1	-4.2	-2.9	-2.9	-2.8	-2.0	-3.1	-3.6	-3.6	-3.1	-3.5	-3.6	-3.3	-3.1	-3.4	-3.3	-2.9	-2.5	-2.7	-2.7	-2.8	-2.6	-2.4	-2.5	-2.2	-2.4	-3.1	-4.3	-6.0
-3.9	-4.1	-3.6	-3.1	-3.0	-3.3	-3.8	-3.5	-3.2	-3.9	-4.8	-4.3	-3.4	-2.8	-2.6	-2.7	-2.4	-2.6	-2.7	-2.7	-2.7	-3.1	-3.2	-3.1	-2.9	-2.6	-2.7	-2.6	-2.5	-2.7	-3.2	-3.1	-3.0	-3.0	-3.2	-3.8
-3.1	-2.7	-2.4	-1.9	-1.9	-2.5	-2.4	-2.6	-2.6	-2.6	-3.1	-3.3	-2.7	-2.7	-2.3	-2.2	-1.9	-2.3	-2.5	-2.9	-2.6	-2.5	-2.3	-2.4	-2.3	-2.2	-1.3	-1.4	-1.9	-2.4	-2.4	-2.1	-2.6	-3.1	-3.4	-3.5
-2.5	-2.2	-1.8	-1.5	-.9	-1.2	-1.4	-1.6	-1.5	-1.7	-2.4	-2.0	-2.0	-1.8	-1.3	-.8	-.5	-1.0	-1.1	-1.2	-1.1	-.6	-.6	-.7	-.7	-.6	-.5	-.4	-.4	-.4	-.4	-.2	-.4	-.9	-2.3	-2.9
-.5	-.6	-.7	-.6	-.2	-.2	-.3	-.3	-.2	-.2	-.4	-.6	-.6	-.4	-.1	.2	.1	.0	.0	-.1	-.1	-.2	-.3	-.5	-.5	-.4	-.3	-.2	-.1	.0	.1	.2	.2	.4	-.2	-.5

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



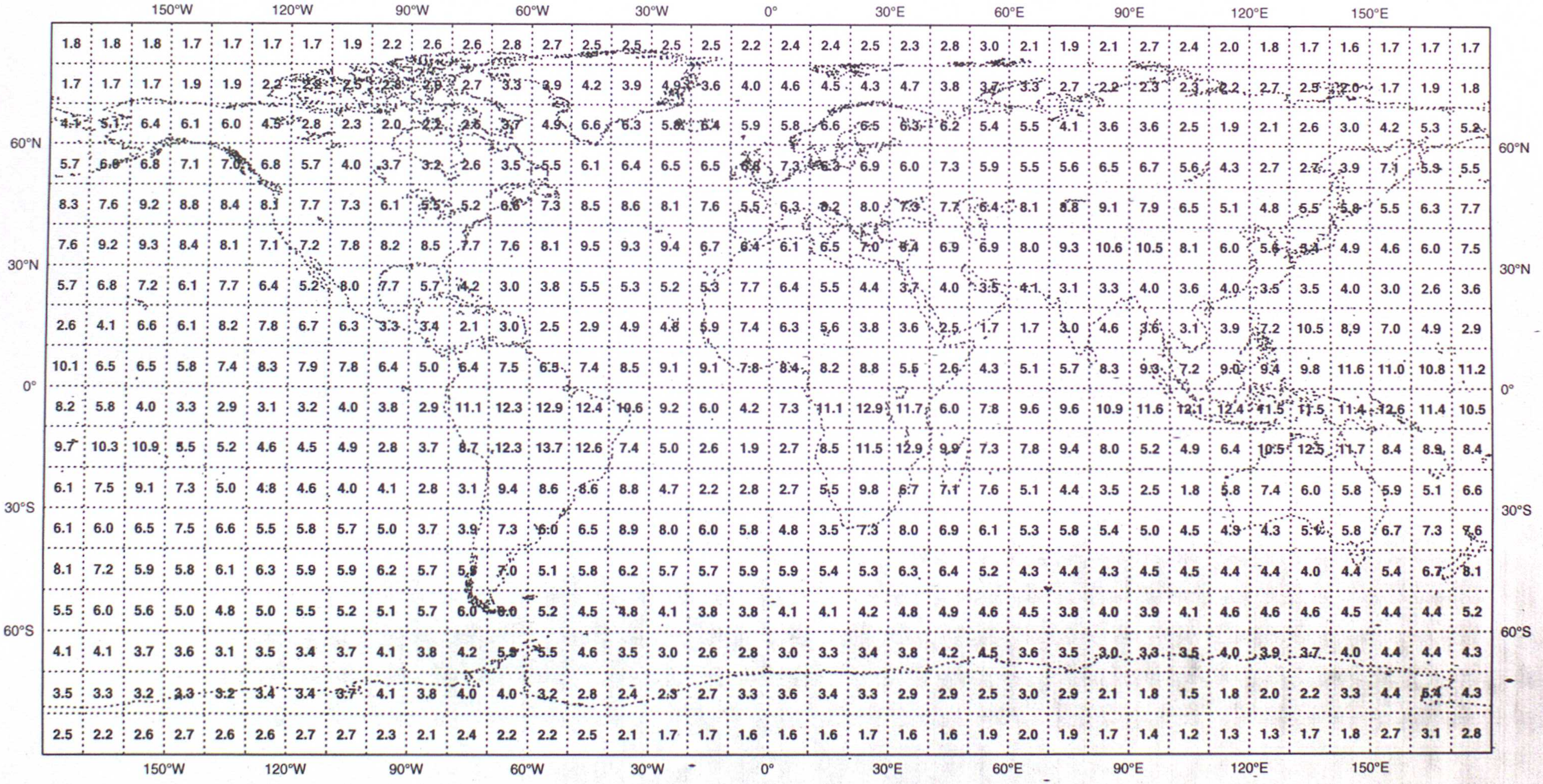
.5	.4	.4	.4	.5	.5	.6	.7	1.0	1.2	1.2	1.3	1.2	1.1	1.1	1.2	1.4	1.5	1.7	1.6	1.5	1.4	1.5	1.5	1.0	.8	.9	1.3	1.0	.8	.7	.7	.6	.6	.6	.5
.8	.9	.9	1.0	1.0	1.0	.9	1.1	1.3	1.5	1.3	1.6	2.3	2.8	2.5	2.9	2.4	2.9	3.4	3.3	3.4	3.6	2.7	2.5	2.2	1.7	1.2	1.2	1.2	1.2	1.6	1.5	1.1	.9	.9	.7
3.0	3.7	4.4	4.4	4.3	3.2	1.8	1.4	1.1	1.2	1.4	2.3	3.6	4.6	4.7	4.6	4.7	4.4	4.3	4.7	4.7	4.6	4.4	3.7	3.6	2.7	2.4	2.2	1.5	1.0	1.0	1.4	1.6	2.5	3.4	3.6
4.3	4.4	4.9	5.6	5.5	5.0	3.9	2.7	2.7	2.3	1.8	2.4	4.0	4.7	5.2	5.1	5.4	5.7	5.5	4.7	5.0	4.2	4.8	3.9	3.4	3.6	4.1	4.0	3.2	2.3	1.4	1.3	2.3	4.2	3.5	4.1
6.5	6.1	7.8	7.1	6.6	6.3	6.2	5.6	4.7	4.2	4.0	5.4	5.8	7.0	7.2	6.9	6.4	4.4	4.7	5.8	5.7	5.1	5.3	4.5	5.8	6.1	6.1	5.1	4.1	3.2	3.2	3.8	4.1	4.2	4.9	6.0
6.5	8.1	8.2	7.2	7.0	6.1	6.0	6.4	6.7	7.0	6.6	6.9	7.2	8.2	7.8	8.3	5.6	5.7	5.6	5.2	5.7	4.8	5.1	5.7	6.9	7.0	7.2	7.4	6.1	4.5	4.8	4.7	4.3	4.1	5.3	6.7
5.1	6.3	7.2	5.6	7.1	5.3	4.2	7.1	6.5	5.3	3.6	2.3	3.4	4.4	4.2	4.0	4.3	7.2	5.6	4.6	3.2	2.5	3.1	2.7	3.0	2.1	2.2	3.3	3.0	3.8	3.5	3.8	3.8	2.7	2.8	3.8
2.5	4.7	6.6	6.3	8.0	6.9	6.0	5.6	2.8	3.1	1.2	1.8	1.5	1.8	4.0	4.5	5.9	6.7	6.2	4.0	2.3	2.6	2.0	.9	.8	1.5	3.1	2.4	2.5	3.1	5.7	8.4	6.6	4.4	3.1	1.8
7.9	5.5	6.0	5.3	6.9	7.4	7.1	6.9	5.7	4.6	5.6	6.2	5.6	6.6	8.0	8.3	8.3	6.8	6.9	6.9	7.0	5.1	2.2	3.8	4.3	4.3	7.1	8.1	6.3	8.4	8.5	8.6	9.7	9.1	8.8	8.8
7.2	5.3	3.4	3.0	2.4	2.3	2.5	3.3	3.2	3.1	9.2	10.7	11.1	10.9	9.6	8.0	5.3	3.5	6.2	9.9	11.0	10.0	5.4	7.3	9.1	9.0	10.5	11.1	10.9	11.1	10.4	10.6	10.0	10.6	9.6	9.0
8.5	9.3	10.0	5.0	4.3	3.4	3.3	3.9	2.2	2.8	7.5	10.4	11.6	11.1	6.9	3.8	1.8	1.0	2.0	7.6	10.1	10.8	8.7	6.2	6.7	8.0	6.8	4.5	3.7	5.0	8.4	10.7	9.7	7.0	7.2	7.2
5.4	6.6	8.5	7.0	4.5	4.3	3.8	3.3	3.3	2.1	2.2	8.4	7.2	8.0	8.4	4.1	1.5	1.9	1.9	5.7	9.2	5.9	6.6	7.0	4.9	3.9	3.0	2.1	1.3	5.0	6.6	6.0	5.5	5.3	4.4	5.6
5.5	5.6	6.5	7.1	6.1	5.4	5.5	5.3	4.4	3.0	3.1	6.9	5.8	6.2	8.7	7.6	5.5	5.1	4.4	3.2	6.6	7.4	6.5	5.6	4.9	5.5	5.0	4.8	4.3	4.1	4.6	5.4	6.2	6.9	7.1	6.9
7.4	6.7	5.3	5.5	5.8	5.7	5.4	5.4	5.6	5.0	4.8	6.2	4.6	5.3	5.6	5.0	4.7	5.0	5.0	4.7	4.7	5.5	5.8	4.6	3.8	4.0	3.8	3.9	3.9	4.0	3.9	3.5	3.8	4.8	6.0	7.2
5.0	5.2	5.0	4.5	4.1	4.2	4.6	4.4	4.4	4.8	5.1	5.1	4.6	3.8	3.7	3.3	2.9	2.8	3.2	3.2	3.2	3.8	4.1	3.5	3.6	3.1	3.1	2.9	3.2	3.6	3.8	3.9	3.7	3.5	3.8	4.6
3.1	3.0	2.7	2.6	2.1	2.3	2.4	2.7	3.0	2.7	3.0	3.5	3.6	3.2	2.3	2.0	1.6	2.0	2.1	2.4	2.4	2.6	3.0	3.3	2.7	2.6	2.1	2.3	2.5	2.9	2.8	2.6	2.9	3.1	3.3	3.4
2.5	2.3	2.1	2.2	2.0	2.2	2.0	2.3	2.6	2.4	2.6	2.4	1.9	1.7	1.4	1.4	1.4	1.7	2.0	1.9	1.8	1.5	1.4	1.2	1.8	1.6	1.1	.8	.7	.9	1.0	1.2	2.0	2.8	3.7	3.1
1.2	1.1	1.4	1.5	1.4	1.4	1.4	1.4	1.1	1.0	1.1	1.1	1.2	1.3	1.0	.7	.7	.7	.6	.7	.8	.7	.7	.8	.9	.8	.9	.8	.7	.6	.5	.5	.5	.7	.7	1.2	1.4	1.2

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



-3.4	-3.3	-3.3	-3.1	-3.4	-3.4	-3.5	-3.5	-3.6	-3.1	-2.7	-3.0	-2.4	-2.1	-1.8	-2.5	-2.9	-2.8	-3.2	-3.5	-3.4	-3.2	-3.2	-3.6	-3.1	-2.8	-3.2	-3.7	-3.5	-3.3	-3.1	-3.0	-3.0	-3.2	-3.4	-3.4
-2.7	-2.8	-3.0	-3.0	-3.1	-3.7	-4.1	-4.5	-5.3	-4.5	-2.5	-2.4	-2.5	-3.8	-3.3	-2.0	-3.0	-3.3	-4.3	-4.2	-4.2	-3.8	-3.1	-3.0	-2.9	-2.5	-2.6	-3.2	-2.9	-3.1	-3.3	-3.3	-3.1	-2.7	-2.7	-2.7
-2.7	-3.0	-4.2	-3.6	-3.6	-2.3	-2.0	-2.5	-2.7	-2.4	-2.5	-2.7	-4.0	-5.1	-4.4	-3.9	-4.0	-4.0	-4.7	-4.8	-4.2	-4.5	-4.4	-4.0	-3.8	-3.5	-3.1	-2.7	-2.1	-1.8	-1.8	-1.8	-2.1	-2.5	-3.2	-3.6
-4.8	-4.4	-5.0	-5.5	-5.4	-4.4	-3.0	-1.9	-2.4	-2.3	-2.4	-2.6	-4.1	-4.3	-3.7	-2.7	-1.9	-3.0	-3.6	-3.3	-4.3	-3.4	-3.8	-3.2	-2.9	-2.9	-4.2	-4.8	-4.1	-3.2	-1.8	-1.6	-2.5	-5.6	-4.9	-5.4
-5.7	-5.2	-6.6	-7.0	-5.9	-5.4	-5.7	-4.2	-3.4	-3.2	-2.5	-3.8	-4.1	-5.4	-5.2	-3.6	-3.3	-2.0	-2.8	-5.2	-5.2	-4.8	-5.0	-2.3	-3.3	-4.5	-4.0	-2.1	-1.5	-1.5	-1.8	-3.0	-3.7	-4.2	-4.5	-5.4
-3.5	-4.8	-5.5	-4.2	-3.6	-2.8	-3.2	-4.0	-4.3	-4.2	-3.4	-3.7	-4.2	-5.1	-4.4	-4.8	-2.8	-2.2	-1.5	-1.3	-2.8	-2.8	-2.5	-2.0	-2.9	-3.7	-3.8	-5.5	-2.9	-.8	-1.3	-1.9	-1.6	-1.4	-2.2	-3.3
-.2	-.9	-1.2	-.8	-2.9	-1.1	-.1	-2.6	2.7	-1.0	.5	1.3	.8	.0	.0	-.2	.1	-1.8	-.7	-.2	.7	.6	.6	1.4	1.0	2.1	2.5	.2	1.1	1.0	1.3	.7	.6	.6	.9	.6
1.1	.6	-.4	-.5	-2.5	-1.6	-.9	-1.2	.4	.9	2.0	2.0	1.7	1.2	-.1	-.6	-1.1	-2.5	-2.2	.6	.7	1.7	1.9	2.1	1.8	2.9	2.0	1.2	.2	.7	-1.2	-3.9	-2.9	-1.0	.0	.7
-3.3	-.5	-.5	.0	-1.0	-1.8	-1.9	-1.8	-.8	.4	.5	-.7	-.9	-1.3	-3.3	-3.6	-3.1	-2.7	-3.4	-3.1	-2.7	.4	1.6	.7	-.1	.1	-2.2	-5.3	-4.3	-5.8	-3.9	-5.8	-7.9	-7.3	-6.0	-5.8
-2.2	-.5	.6	1.0	1.1	.8	.5	.4	.6	1.3	-4.6	-8.4	-10.1	-10.8	-5.4	-2.5	-.1	.7	-1.1	-6.0	-8.2	-5.8	-.4	-2.0	-4.3	-4.4	-5.9	-7.8	-11.5	-10.7	-9.1	-11.0	-9.1	-6.9	-6.2	-4.8
-4.3	-4.4	-4.6	-.3	.2	.6	.5	.3	1.1	.8	-2.7	-7.4	-10.9	-10.2	-2.5	.4	1.3	1.6	1.6	-3.6	-7.9	-7.6	-3.4	-1.4	-1.6	-2.8	-1.8	.2	-.3	-1.9	-6.2	-7.4	-8.7	-2.1	-2.7	-4.2
-.9	-1.7	-3.8	-2.2	-.3	-.2	.3	.8	1.1	1.6	1.4	-2.7	-1.7	-2.9	-3.3	.3	1.5	1.3	1.8	-.4	-5.1	-.8	-1.6	-1.4	.0	.7	1.0	1.4	1.6	.6	-1.3	-.9	-.9	-.5	-.1	-1.0
-1.3	-1.0	-2.0	-2.4	-1.6	-1.0	-1.1	-.9	.2	1.1	1.2	-1.4	-.6	-1.1	-4.2	-4.2	-1.5	-1.3	.0	1.1	-1.4	-1.8	-1.6	-1.3	-.9	-.9	-.4	-.2	.1	.2	-.4	-.2	-1.5	-2.4	-2.4	-2.6
-5.1	-3.8	-1.9	-2.2	-2.3	-2.7	-2.6	-2.6	-2.5	-1.2	-.9	-2.1	-.5	-1.5	-2.2	-2.4	-2.2	-2.6	-2.5	-1.9	-1.8	-2.0	-1.9	-1.3	-1.0	-1.3	-1.2	-1.4	-1.2	-.9	-.9	-.5	-.9	-1.8	-3.6	-4.8
-3.3	-3.4	-3.1	-2.4	-2.5	-2.7	-3.4	-3.0	-2.5	-3.0	-3.6	-3.4	-2.4	-2.0	-2.5	-2.9	-2.8	-3.2	-3.2	-3.0	-2.8	-3.1	-3.1	-2.8	-2.8	-2.5	-2.8	-2.8	-2.7	-2.9	-3.2	-3.0	-2.8	-2.7	-2.8	-3.3
-3.3	-2.9	-2.6	-2.3	-2.5	-2.9	-2.8	-2.8	-2.7	-2.7	-3.3	-4.1	-3.8	-3.6	-3.3	-3.2	-3.0	-3.4	-3.6	-3.9	-3.2	-3.2	-3.1	-3.5	-3.0	-2.6	-1.8	-2.2	-2.8	-3.4	-3.3	-2.9	-3.3	-4.1	-4.0	-3.8
-3.5	-3.0	-2.6	-2.6	-1.9	-2.4	-2.8	-3.1	-3.3	-3.4	-4.5	-4.2	-3.8	-3.2	-2.4	-1.7	-1.7	-2.5	-2.7	-3.0	-2.8	-1.9	-2.1	-2.4	-2.0	-1.7	-1.7	-1.7	-1.7	-1.7	-1.6	-1.2	-1.6	-2.3	-4.1	-4.2
-2.2	-2.3	-2.5	-2.3	-1.7	-1.5	-1.9	-2.1	-1.8	-1.9	-2.3	-2.4	-2.3	-2.1	-1.5	-1.0	-.9	-1.0	-1.2	-1.2	-1.1	-1.3	-1.7	-2.2	-2.4	-2.1	-1.9	-1.5	-1.1	-.9	-.7	-.5	-.6	-.1	-1.3	-2.2

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.9	2.2	2.6	2.6	2.8	2.7	2.5	2.5	2.5	2.5	2.2	2.4	2.4	2.5	2.3	2.8	3.0	2.1	1.9	2.1	2.7	2.4	2.0	1.8	1.7	1.6	1.7	1.7	1.7
1.7	1.7	1.7	1.9	1.9	2.2	2.8	2.5	2.8	2.9	2.7	3.3	3.9	4.2	3.9	4.9	3.6	4.0	4.6	4.5	4.3	4.7	3.8	3.7	3.3	2.7	2.2	2.3	2.3	2.2	2.7	2.5	2.0	1.7	1.9	1.8
4.1	5.1	6.4	6.1	6.0	4.5	2.8	2.3	2.0	2.2	2.6	3.7	4.9	6.6	6.3	5.8	6.4	5.9	5.8	6.6	6.5	6.3	6.2	5.4	5.5	4.1	3.6	3.6	2.5	1.9	2.1	2.6	3.0	4.2	5.3	5.2
5.7	6.8	6.8	7.1	7.0	6.8	5.7	4.0	3.7	3.2	2.6	3.5	5.5	6.1	6.4	6.5	6.5	6.8	7.3	6.3	6.9	6.0	7.3	5.9	5.5	5.6	6.5	6.7	5.6	4.3	2.7	2.7	3.9	7.1	5.3	5.5
8.3	7.6	9.2	8.8	8.4	8.1	7.7	7.3	6.1	5.5	5.2	6.6	7.3	8.5	8.6	8.1	7.6	5.5	6.3	8.2	8.0	7.3	7.7	6.4	8.1	8.8	9.1	7.9	6.5	5.1	4.8	5.5	5.8	5.5	6.3	7.7
7.6	9.2	9.3	8.4	8.1	7.1	7.2	7.8	8.2	8.5	7.7	7.6	8.1	9.5	9.3	9.4	6.7	6.4	6.1	6.5	7.0	8.4	6.9	6.9	8.0	9.3	10.6	10.5	8.1	6.0	5.6	5.4	4.9	4.6	6.0	7.5
5.7	6.8	7.2	6.1	7.7	6.4	5.2	8.0	7.7	5.7	4.2	3.0	3.8	5.5	5.3	5.2	5.3	7.7	6.4	5.5	4.4	3.7	4.0	3.5	4.1	3.1	3.3	4.0	3.6	4.0	3.5	3.5	4.0	3.0	2.6	3.6
2.6	4.1	6.6	6.1	8.2	7.8	6.7	6.3	3.3	3.4	2.1	3.0	2.5	2.9	4.9	4.8	5.9	7.4	6.3	5.6	3.8	3.6	2.5	1.7	1.7	3.0	4.6	3.6	3.1	3.9	7.2	10.5	8.9	7.0	4.9	2.9
10.1	6.5	6.5	5.8	7.4	8.3	7.9	7.8	6.4	5.0	6.4	7.5	6.5	7.4	8.5	9.1	9.1	7.8	8.4	8.2	8.8	5.5	2.6	4.3	5.1	5.7	8.3	9.3	7.2	9.0	9.4	9.8	11.6	11.0	10.8	11.2
8.2	5.8	4.0	3.3	2.9	3.1	3.2	4.0	3.8	2.9	11.1	12.3	12.9	12.4	10.6	9.2	6.0	4.2	7.3	11.1	12.9	11.7	6.0	7.8	9.6	9.6	10.9	11.6	12.1	12.4	11.5	11.5	11.4	12.6	11.4	10.5
9.7	10.3	10.9	5.5	5.2	4.6	4.5	4.9	2.8	3.7	8.7	12.3	13.7	12.6	7.4	5.0	2.6	1.9	2.7	8.5	11.5	12.9	9.9	7.3	7.8	9.4	8.0	5.2	4.9	6.4	10.5	12.5	11.7	8.4	8.9	8.4
6.1	7.5	9.1	7.3	5.0	4.8	4.6	4.0	4.1	2.8	3.1	9.4	8.6	8.6	8.8	4.7	2.2	2.8	2.7	5.5	9.8	6.7	7.1	7.6	5.1	4.4	3.5	2.5	1.8	5.8	7.4	6.0	5.8	5.9	5.1	6.6
6.1	6.0	6.5	7.5	6.6	5.5	5.8	5.7	5.0	3.7	3.9	7.3	6.0	6.5	8.9	8.0	6.0	5.8	4.8	3.5	7.3	8.0	6.9	6.1	5.3	5.8	5.4	5.0	4.5	4.9	4.3	5.1	5.8	6.7	7.3	7.6
8.1	7.2	5.9	5.8	6.1	6.3	5.9	5.9	6.2	5.7	5.8	7.0	5.1	5.8	6.2	5.7	5.7	5.9	5.9	5.4	5.3	6.3	6.4	5.2	4.3	4.4	4.3	4.5	4.5	4.4	4.4	4.0	4.4	5.4	6.7	8.1
5.5	6.0	5.6	5.0	4.8	5.0	5.5	5.2	5.1	5.7	6.0	8.0	5.2	4.5	4.8	4.1	3.8	3.8	4.1	4.1	4.2	4.8	4.9	4.6	4.5	3.8	4.0	3.9	4.1	4.6	4.6	4.6	4.5	4.4	4.4	5.2
4.1	4.1	3.7	3.6	3.1	3.5	3.4	3.7	4.1	3.8	4.2	5.9	5.5	4.6	3.5	3.0	2.6	2.8	3.0	3.3	3.4	3.8	4.2	4.5	3.6	3.5	3.0	3.3	3.5	4.0	3.9	3.7	4.0	4.4	4.4	4.3
3.5	3.3	3.2	3.3	3.2	3.4	3.4	3.7	4.1	3.8	4.0	4.0	3.2	2.8	2.4	2.3	2.7	3.3	3.6	3.4	3.3	2.9	2.9	2.5	3.0	2.9	2.1	1.8	1.5	1.8	2.0	2.2	3.3	4.4	5.4	4.3
2.5	2.2	2.6	2.7	2.6	2.6	2.7	2.7	2.3	2.1	2.4	2.2	2.2	2.5	2.1	1.7	1.7	1.6	1.6	1.6	1.7	1.6	1.6	1.9	2.0	1.9	1.7	1.4	1.2	1.3	1.3	1.7	1.8	2.7	3.1	2.8

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

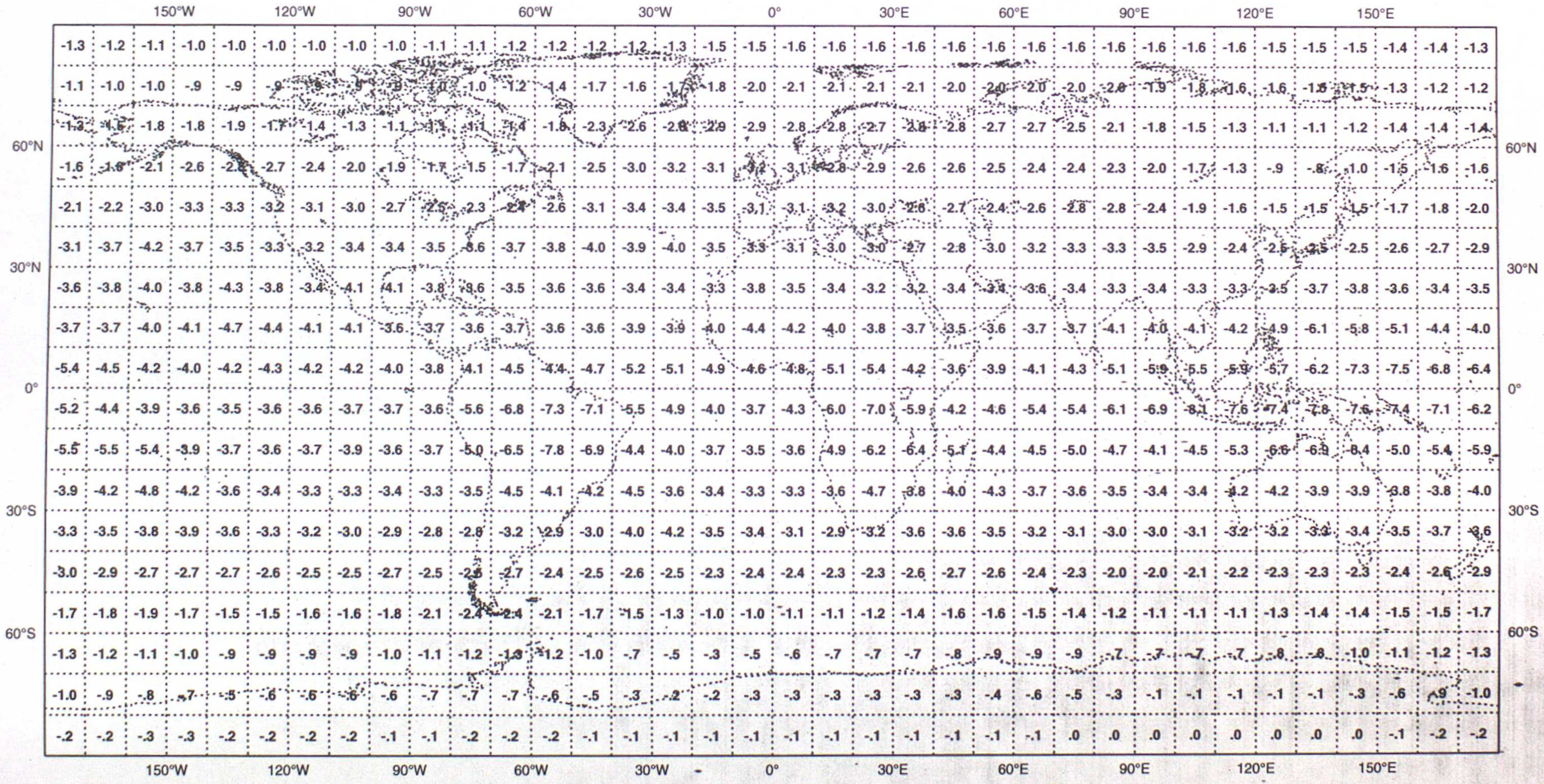
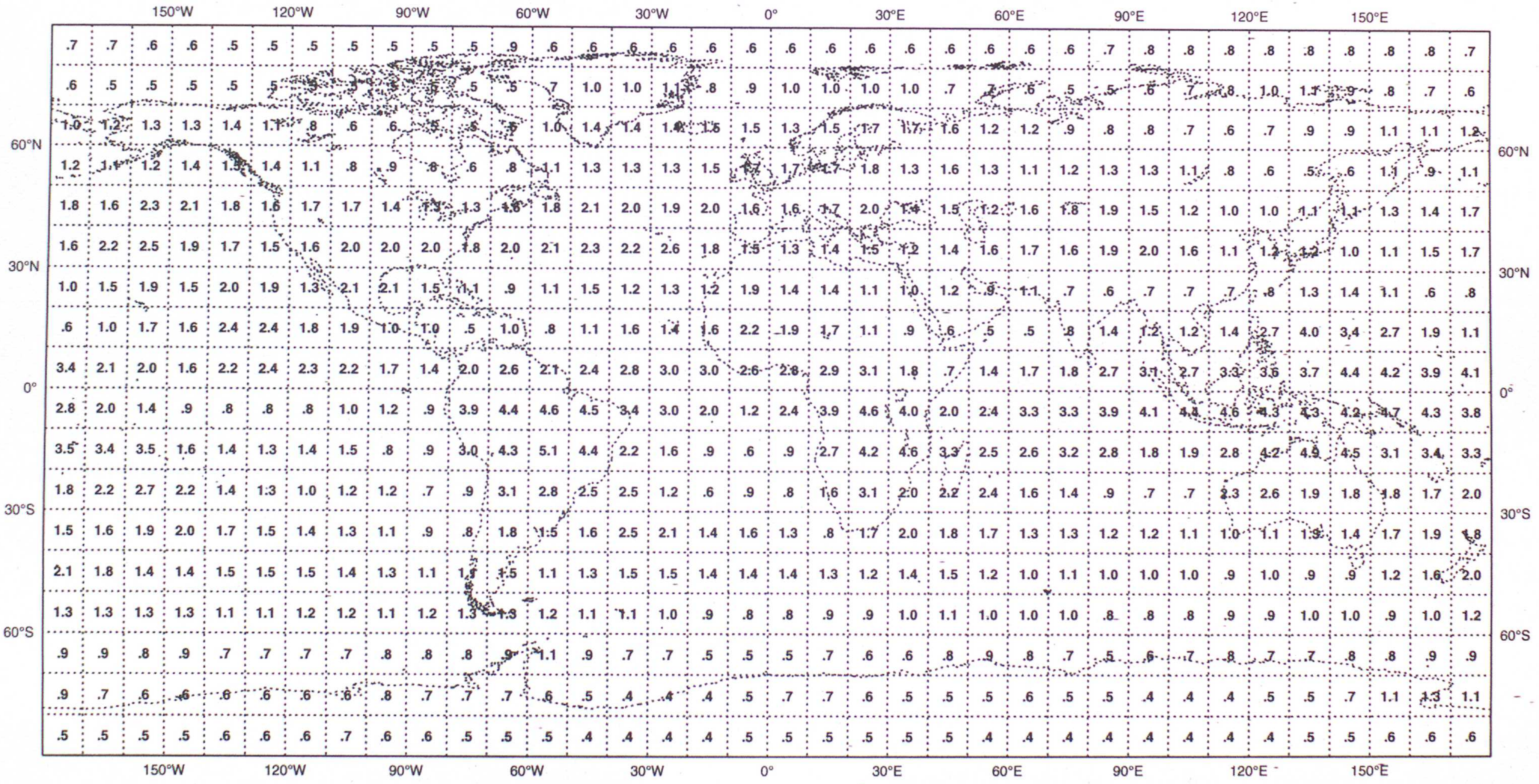

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-1.3 -1.2 -1.1 -1.0 -1.0 -1.0 -1.0 -1.0 -1.0 -1.1 -1.1 -1.2 -1.2 -1.2 -1.2 -1.3 -1.5 -1.5 -1.6 -1.6 -1.6 -1.6 -1.6 -1.6 -1.6 -1.6 -1.6 -1.6 -1.6 -1.6 -1.5 -1.5 -1.5 -1.4 -1.4 -1.3
-1.1 -1.0 -1.0 -.9 -.9 -.9 -.9 -.9 -.9 -1.0 -1.0 -1.2 -1.4 -1.7 -1.6 -1.7 -1.8 -2.0 -2.1 -2.1 -2.1 -2.1 -2.0 -2.0 -2.0 -2.0 -2.0 -1.9 -1.8 -1.6 -1.6 -1.5 -1.5 -1.3 -1.2 -1.2
-1.3 -1.6 -1.8 -1.8 -1.9 -1.7 -1.4 -1.3 -1.1 -1.1 -1.1 -1.4 -1.8 -2.3 -2.6 -2.8 -2.9 -2.9 -2.8 -2.8 -2.7 -2.8 -2.8 -2.7 -2.7 -2.5 -2.1 -1.8 -1.5 -1.3 -1.1 -1.1 -1.2 -1.4 -1.4 -1.4
-1.6 -1.6 -2.1 -2.6 -2.8 -2.7 -2.4 -2.0 -1.9 -1.7 -1.5 -1.7 -2.1 -2.5 -3.0 -3.2 -3.1 -3.2 -3.1 -2.8 -2.9 -2.6 -2.6 -2.5 -2.4 -2.4 -2.3 -2.0 -1.7 -1.3 -.9 -.8 -1.0 -1.5 -1.6 -1.6
-2.1 -2.2 -3.0 -3.3 -3.3 -3.2 -3.1 -3.0 -2.7 -2.5 -2.3 -2.4 -2.6 -3.1 -3.4 -3.4 -3.5 -3.1 -3.1 -3.2 -3.0 -2.6 -2.7 -2.4 -2.6 -2.8 -2.8 -2.4 -1.9 -1.6 -1.5 -1.5 -1.5 -1.7 -1.8 -2.0
-3.1 -3.7 -4.2 -3.7 -3.5 -3.3 -3.2 -3.4 -3.4 -3.5 -3.6 -3.7 -3.8 -4.0 -3.9 -4.0 -3.5 -3.3 -3.1 -3.0 -3.0 -2.7 -2.8 -3.0 -3.2 -3.3 -3.3 -3.5 -2.9 -2.4 -2.5 -2.5 -2.5 -2.6 -2.7 -2.9
-3.6 -3.8 -4.0 -3.8 -4.3 -3.8 -3.4 -4.1 -4.1 -3.8 -3.6 -3.5 -3.6 -3.6 -3.4 -3.4 -3.3 -3.8 -3.5 -3.4 -3.2 -3.2 -3.4 -3.4 -3.6 -3.4 -3.3 -3.4 -3.3 -3.3 -3.5 -3.7 -3.8 -3.6 -3.4 -3.5
-3.7 -3.7 -4.0 -4.1 -4.7 -4.4 -4.1 -4.1 -3.6 -3.7 -3.6 -3.7 -3.6 -3.6 -3.9 -3.9 -4.0 -4.4 -4.2 -4.0 -3.8 -3.7 -3.5 -3.6 -3.7 -3.7 -4.1 -4.0 -4.1 -4.2 -4.9 -6.1 -5.8 -5.1 -4.4 -4.0
-5.4 -4.5 -4.2 -4.0 -4.2 -4.3 -4.2 -4.2 -4.0 -3.8 -4.1 -4.5 -4.4 -4.7 -5.2 -5.1 -4.9 -4.6 -4.8 -5.1 -5.4 -4.2 -3.6 -3.9 -4.1 -4.3 -5.1 -5.9 -5.5 -5.9 -5.7 -6.2 -7.3 -7.5 -6.8 -6.4
-5.2 -4.4 -3.9 -3.6 -3.5 -3.6 -3.6 -3.7 -3.7 -3.6 -5.6 -6.8 -7.3 -7.1 -5.5 -4.9 -4.0 -3.7 -4.3 -6.0 -7.0 -5.9 -4.2 -4.6 -5.4 -5.4 -6.1 -6.9 -8.1 -7.6 -7.4 -7.8 -7.6 -7.4 -7.1 -6.2
-5.5 -5.5 -5.4 -3.9 -3.7 -3.6 -3.7 -3.9 -3.6 -3.7 -5.0 -6.5 -7.8 -6.9 -4.4 -4.0 -3.7 -3.5 -3.6 -4.9 -6.2 -6.4 -5.1 -4.4 -4.5 -5.0 -4.7 -4.1 -4.5 -5.3 -6.6 -6.9 -8.4 -5.0 -5.4 -5.9
-3.9 -4.2 -4.8 -4.2 -3.6 -3.4 -3.3 -3.3 -3.4 -3.3 -3.5 -4.5 -4.1 -4.2 -4.5 -3.6 -3.4 -3.3 -3.3 -3.6 -4.7 -3.8 -4.0 -4.3 -3.7 -3.6 -3.5 -3.4 -3.4 -4.2 -4.2 -3.9 -3.9 -3.8 -3.8 -4.0
-3.3 -3.5 -3.8 -3.9 -3.6 -3.3 -3.2 -3.0 -2.9 -2.8 -2.8 -3.2 -2.9 -3.0 -4.0 -4.2 -3.5 -3.4 -3.1 -2.9 -3.2 -3.6 -3.6 -3.5 -3.2 -3.1 -3.0 -3.0 -3.1 -3.2 -3.2 -3.3 -3.4 -3.5 -3.7 -3.6
-3.0 -2.9 -2.7 -2.7 -2.7 -2.6 -2.5 -2.5 -2.7 -2.5 -2.5 -2.7 -2.4 -2.5 -2.6 -2.5 -2.3 -2.4 -2.4 -2.3 -2.3 -2.6 -2.7 -2.6 -2.4 -2.3 -2.0 -2.0 -2.1 -2.2 -2.3 -2.3 -2.3 -2.4 -2.6 -2.9
-1.7 -1.8 -1.9 -1.7 -1.5 -1.5 -1.6 -1.6 -1.8 -2.1 -2.4 -2.4 -2.1 -1.7 -1.5 -1.3 -1.0 -1.0 -1.1 -1.1 -1.2 -1.4 -1.6 -1.6 -1.5 -1.4 -1.2 -1.1 -1.1 -1.1 -1.3 -1.4 -1.4 -1.5 -1.5 -1.7
-1.3 -1.2 -1.1 -1.0 -.9 -.9 -.9 -.9 -1.0 -1.1 -1.2 -1.3 -1.2 -1.0 -.7 -.5 -.3 -.5 -.6 -.7 -.7 -.7 -.8 -.9 -.9 -.9 -.7 -.7 -.7 -.7 -.8 -.8 -1.0 -1.1 -1.2 -1.3
-1.0 -.9 -.8 -.7 -.5 -.6 -.6 -.6 -.6 -.7 -.7 -.7 -.6 -.5 -.3 -.2 -.2 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.6 -.5 -.3 -.1 -.1 -.1 -.1 -.1 -.3 -.6 -.9 -1.0
-.2 -.2 -.3 -.3 -.2 -.2 -.2 -.2 -.1 -.1 -.2 -.2 -.2 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 .0 .0 .0 .0 .0 .0 .0 -.1 -.2 -.2

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



.7	.7	.6	.6	.5	.5	.5	.5	.5	.5	.5	.9	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.7	.8	.8	.8	.8	.8	.8	.8	.7
.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.7	1.0	1.0	1.1	.8	.9	1.0	1.0	1.0	1.0	.7	.7	.6	.5	.5	.6	.7	.8	1.0	1.1	.9	.8	.7	.6
1.0	1.2	1.3	1.3	1.4	1.1	.8	.6	.6	.5	.5	.5	1.0	1.4	1.4	1.4	1.5	1.5	1.3	1.5	1.7	1.7	1.6	1.2	1.2	.9	.8	.8	.7	.6	.7	.9	.9	1.1	1.1	1.2
1.2	1.1	1.2	1.4	1.5	1.4	1.1	.8	.9	.8	.6	.8	1.1	1.3	1.3	1.3	1.5	1.7	1.7	1.7	1.8	1.3	1.6	1.3	1.1	1.2	1.3	1.3	1.1	.8	.6	.5	.6	1.1	.9	1.1
1.8	1.6	2.3	2.1	1.8	1.6	1.7	1.7	1.4	1.3	1.3	1.6	1.8	2.1	2.0	1.9	2.0	1.6	1.6	1.7	2.0	1.4	1.5	1.2	1.6	1.8	1.9	1.5	1.2	1.0	1.0	1.1	1.1	1.3	1.4	1.7
1.6	2.2	2.5	1.9	1.7	1.5	1.6	2.0	2.0	2.0	1.8	2.0	2.1	2.3	2.2	2.6	1.8	1.5	1.3	1.4	1.5	1.2	1.4	1.6	1.7	1.6	1.9	2.0	1.6	1.1	1.2	1.2	1.0	1.1	1.5	1.7
1.0	1.5	1.9	1.5	2.0	1.9	1.3	2.1	2.1	1.5	1.1	.9	1.1	1.5	1.2	1.3	1.2	1.9	1.4	1.4	1.1	1.0	1.2	.9	1.1	.7	.6	.7	.7	.7	.8	1.3	1.4	1.1	.6	.8
.6	1.0	1.7	1.6	2.4	2.4	1.8	1.9	1.0	1.0	.5	1.0	.8	1.1	1.6	1.4	1.6	2.2	1.9	1.7	1.1	.9	.6	.5	.5	.8	1.4	1.2	1.2	1.4	2.7	4.0	3.4	2.7	1.9	1.1
3.4	2.1	2.0	1.6	2.2	2.4	2.3	2.2	1.7	1.4	2.0	2.6	2.1	2.4	2.8	3.0	3.0	2.6	2.8	2.9	3.1	1.8	.7	1.4	1.7	1.8	2.7	3.1	2.7	3.3	3.6	3.7	4.4	4.2	3.9	4.1
2.8	2.0	1.4	.9	.8	.8	.8	1.0	1.2	.9	3.9	4.4	4.6	4.5	3.4	3.0	2.0	1.2	2.4	3.9	4.6	4.0	2.0	2.4	3.3	3.3	3.9	4.1	4.4	4.6	4.3	4.3	4.2	4.7	4.3	3.8
3.5	3.4	3.5	1.6	1.4	1.3	1.4	1.5	.8	.9	3.0	4.3	5.1	4.4	2.2	1.6	.9	.6	.9	2.7	4.2	4.6	3.3	2.5	2.6	3.2	2.8	1.8	1.9	2.8	4.2	4.9	4.5	3.1	3.4	3.3
1.8	2.2	2.7	2.2	1.4	1.3	1.0	1.2	1.2	.7	.9	3.1	2.8	2.5	2.5	1.2	.6	.9	.8	1.6	3.1	2.0	2.2	2.4	1.6	1.4	.9	.7	.7	2.3	2.6	1.9	1.8	1.8	1.7	2.0
1.5	1.6	1.9	2.0	1.7	1.5	1.4	1.3	1.1	.9	.8	1.8	1.5	1.6	2.5	2.1	1.4	1.6	1.3	.8	1.7	2.0	1.8	1.7	1.3	1.3	1.2	1.2	1.1	1.0	1.1	1.9	1.4	1.7	1.9	1.8
2.1	1.8	1.4	1.4	1.5	1.5	1.5	1.4	1.3	1.1	1.1	1.5	1.1	1.3	1.5	1.5	1.4	1.4	1.4	1.3	1.2	1.4	1.5	1.2	1.0	1.1	1.0	1.0	1.0	.9	1.0	.9	.9	1.2	1.6	2.0
1.3	1.3	1.3	1.3	1.1	1.1	1.2	1.2	1.1	1.2	1.3	1.3	1.2	1.1	1.1	1.0	.9	.8	.8	.9	.9	1.0	1.1	1.0	1.0	1.0	.8	.8	.8	.9	.9	1.0	1.0	.9	1.0	1.2
.9	.9	.8	.9	.7	.7	.7	.7	.8	.8	.8	.9	1.1	.9	.7	.7	.5	.5	.5	.7	.6	.6	.8	.9	.8	.7	.5	.6	.7	.8	.7	.7	.8	.8	.9	.9
.9	.7	.6	.6	.6	.6	.6	.6	.8	.7	.7	.7	.6	.5	.4	.4	.4	.5	.7	.7	.6	.5	.5	.5	.6	.5	.5	.4	.4	.4	.5	.5	.7	1.1	1.3	1.1
.5	.5	.5	.5	.6	.6	.6	.7	.6	.6	.5	.5	.5	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.6	.6	.6

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

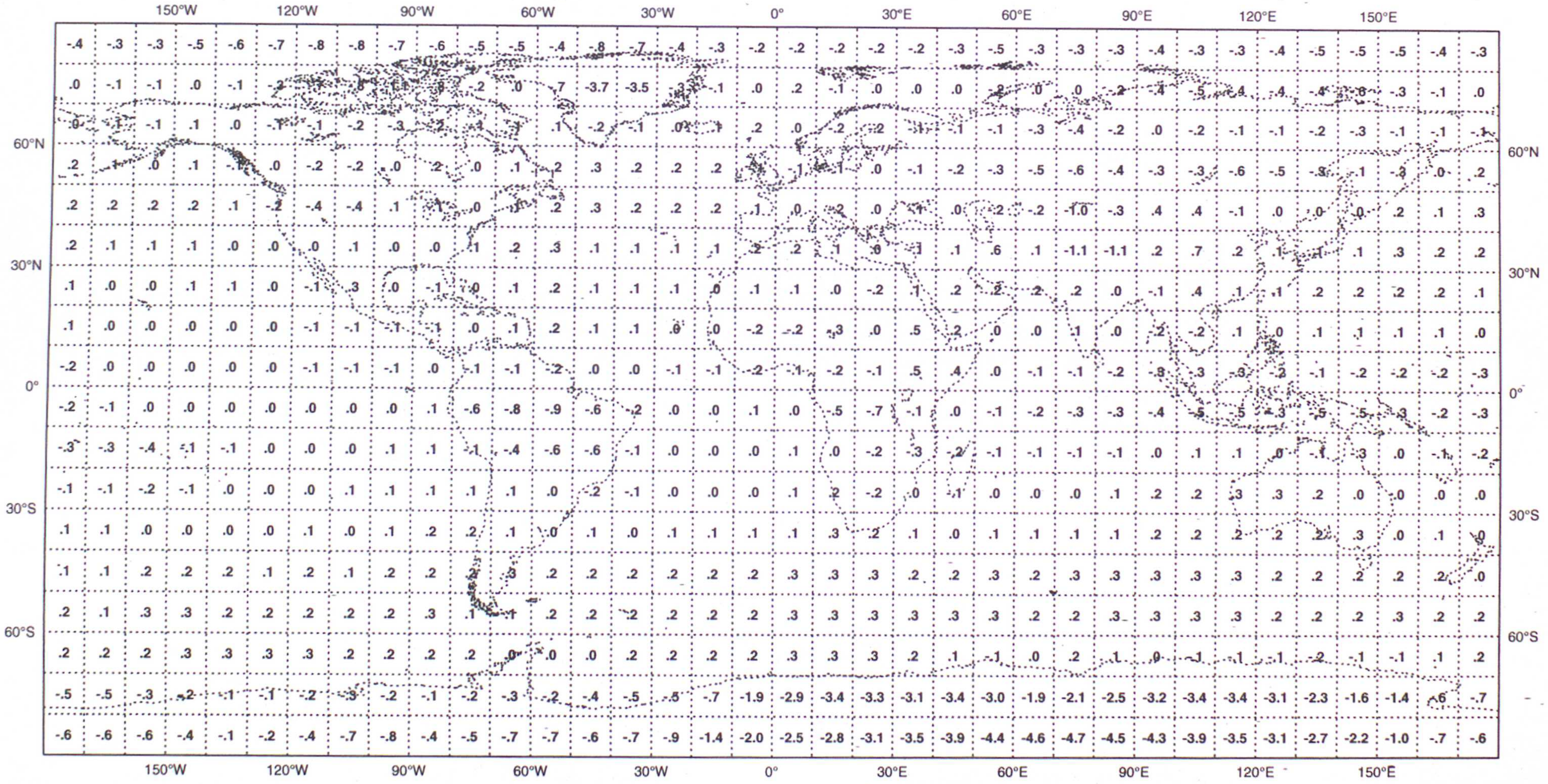
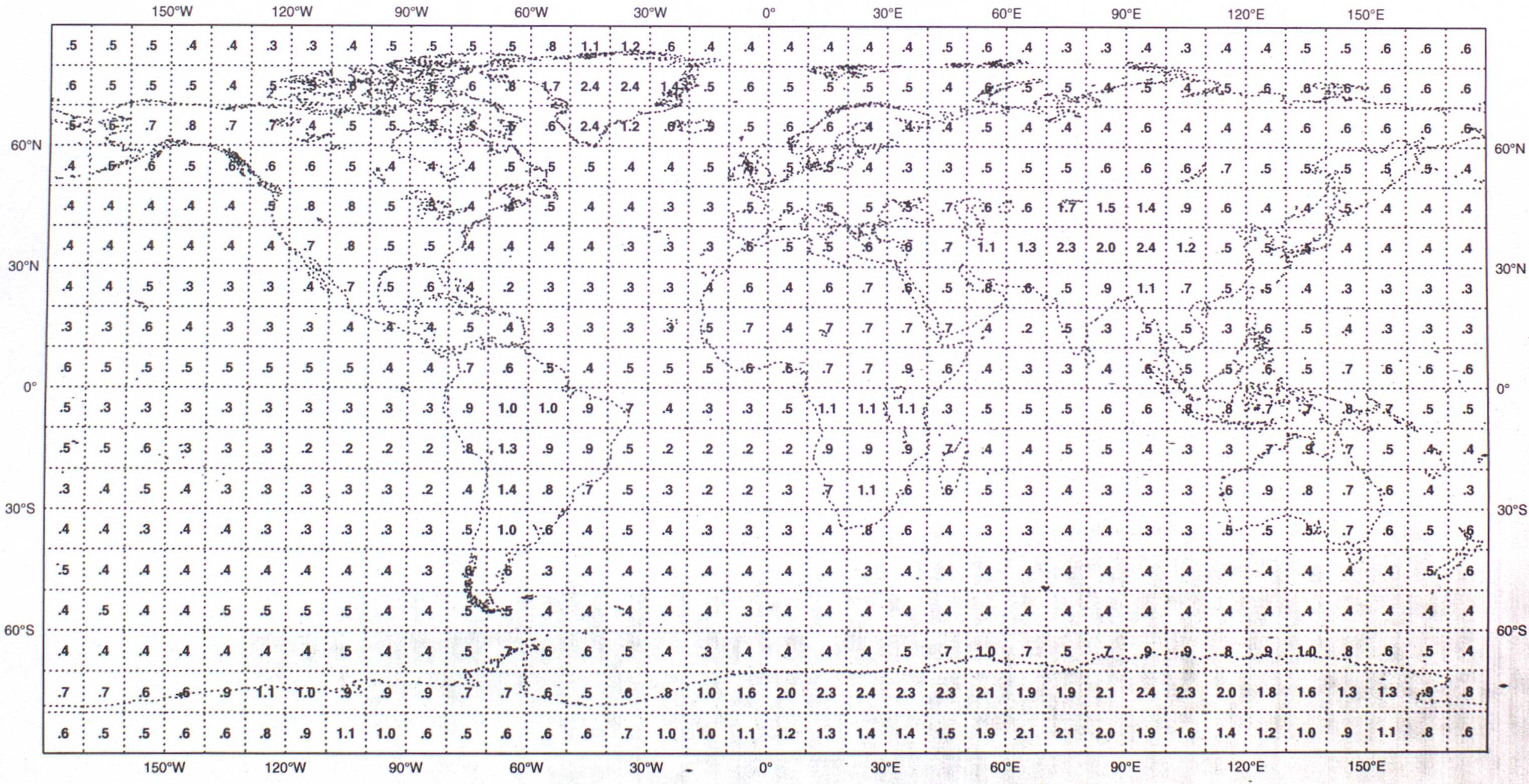

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.4 -.3 -.3 -.5 -.6 -.7 -.8 -.8 -.7 -.6 -.5 -.5 -.4 -.8 -.7 -.4 -.3 -.2 -.2 -.2 -.2 -.2 -.3 -.5 -.3 -.3 -.3 -.4 -.3 -.3 -.4 -.5 -.5 -.5 -.4 -.3
.0 -.1 -.1 .0 -.1 -.2 -.7 -.8 -1.1 -.8 .2 .0 .7 -3.7 -3.5 -.3 -.1 .0 .2 -.1 .0 .0 .0 -.2 .0 .0 -.2 -.4 -.5 -.4 -.4 -.4 -.6 -.3 -.1 .0
.0 -.1 -.1 .1 .0 -.1 -.1 -.2 -.3 -.2 -.1 -.1 .1 -.2 -.1 .0 -.1 .2 .0 -.2 -.2 -.1 -.1 -.1 -.3 -.4 -.2 .0 -.2 -.1 -.1 -.2 -.3 -.1 -.1 -.1
.2 -.1 .0 .1 -.1 .0 -.2 -.2 .0 .2 .0 .1 .2 .3 .2 .2 .2 .1 -.1 -.1 .0 -.1 -.2 -.3 -.5 -.6 -.4 -.3 -.3 -.6 -.5 -.3 -.1 -.3 .0 .2
.2 .2 .2 .2 .1 -.2 -.4 -.4 .1 -.1 .0 -.1 .2 .3 .2 .2 .2 .1 .0 -.2 .0 .1 .0 .2 -.2 -1.0 -.3 .4 .4 -.1 .0 .0 .0 .2 .1 .3
.2 .1 .1 .1 .0 .0 .0 .1 .0 .0 .1 .2 .3 .1 .1 .1 .1 .2 .2 .1 .0 -.1 .1 .6 .1 -1.1 -1.1 .2 .7 .2 .1 .1 .1 .3 .2 .2
.1 .0 .0 .1 .1 .0 -.1 .3 .0 -.1 .0 .1 .2 .1 .1 .1 .0 .1 .1 .0 -.2 .1 .2 .2 .2 .2 .0 -.1 .4 .1 .1 .2 .2 .2 .2 .1
.1 .0 .0 .0 .0 .0 -.1 -.1 -.1 -.1 .0 .1 .2 .1 .1 .0 .0 -.2 -.2 -.3 .0 .5 .2 .0 .0 .1 .0 -.2 -.2 .1 .0 .1 .1 .1 .1 .0
-.2 .0 .0 .0 .0 .0 -.1 -.1 -.1 .0 -.1 -.1 -.2 .0 .0 -.1 -.1 -.2 -.1 -.2 -.1 .5 .4 .0 -.1 -.1 -.2 -.8 -.3 -.3 -.3 -.1 -.2 -.2 -.2 -.3
-.2 -.1 .0 .0 .0 .0 .0 .0 .0 .1 -.6 -.8 -.9 -.6 -.2 .0 .0 .1 .0 -.5 -.7 -.1 .0 -.1 -.2 -.3 -.3 -.4 -.5 -.5 -.3 -.5 -.5 -.3 -.2 -.3
-.3 -.3 -.4 -.1 -.1 .0 .0 .0 .1 .1 -.1 -.4 -.6 -.6 -.1 .0 .0 .0 .1 .0 -.2 -.3 -.2 -.1 -.1 -.1 -.1 .0 .1 .1 .0 -.1 -.3 .0 -.1 -.2
-.1 -.1 -.2 -.1 .0 .0 .0 .1 .1 .1 .1 .1 .0 -.2 -.1 .0 .0 .0 .1 .2 -.2 .0 -.1 .0 .0 .0 .1 .2 .2 .3 .3 .2 .0 .0 .0 .0
.1 .1 .0 .0 .0 .0 .1 .0 .1 .2 .2 .1 .0 .1 .0 .1 .1 .1 .1 .1 .1 .3 .2 .1 .0 .1 .1 .1 .1 .2 .2 .2 .2 .2 .3 .0 .1 .0
.1 .1 .2 .2 .2 .1 .2 .1 .2 .2 .2 .3 .2 .2 .2 .2 .2 .2 .3 .3 .3 .2 .2 .3 .2 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .0
.2 .1 .3 .3 .2 .2 .2 .2 .2 .3 .1 .1 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .2 .2 .3 .3 .3 .3 .2 .2 .2 .3 .2 .2
.2 .2 .2 .3 .3 .3 .3 .2 .2 .2 .2 .0 .0 .0 .2 .2 .2 .2 .3 .3 .3 .2 .1 -.1 .0 .2 .1 .0 -.1 -.1 -.1 -.2 -.1 -.1 .1 .2
-.5 -.5 -.3 -.2 -.1 -.1 -.2 -.3 -.2 -.1 -.2 -.3 -.2 -.4 -.5 -.5 -.7 -1.9 -2.9 -3.4 -3.3 -3.1 -3.4 -3.0 -1.9 -2.1 -2.5 -3.2 -3.4 -3.4 -3.1 -2.3 -1.6 -1.4 -.6 -.7
-.6 -.6 -.6 -.4 -.1 -.2 -.4 -.7 -.8 -.4 -.5 -.7 -.7 -.6 -.7 -.9 -1.4 -2.0 -2.5 -2.8 -3.1 -3.5 -3.9 -4.4 -4.6 -4.7 -4.5 -4.3 -3.9 -3.5 -3.1 -2.7 -2.2 -1.0 -.7 -.6

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



.5	.5	.5	.4	.4	.3	.3	.4	.5	.5	.5	.5	.8	1.1	1.2	.6	.4	.4	.4	.4	.4	.4	.5	.6	.4	.3	.3	.4	.3	.4	.4	.5	.5	.6	.6	.6
.6	.5	.5	.5	.4	.5	.5	.6	.7	.6	.6	.8	1.7	2.4	2.4	1.4	.5	.6	.5	.5	.5	.5	.4	.6	.5	.5	.4	.5	.4	.5	.6	.6	.6	.6	.6	.6
.5	.6	.7	.8	.7	.7	.4	.5	.5	.5	.6	.5	.6	2.4	1.2	.6	.5	.5	.6	.6	.4	.4	.4	.5	.4	.4	.4	.6	.4	.4	.4	.6	.6	.6	.6	.6
.4	.5	.6	.5	.6	.6	.6	.5	.4	.4	.4	.5	.5	.5	.4	.4	.5	.6	.5	.5	.4	.3	.3	.5	.5	.5	.6	.6	.6	.7	.5	.5	.5	.5	.5	.4
.4	.4	.4	.4	.4	.5	.8	.8	.5	.5	.4	.4	.5	.4	.4	.3	.3	.5	.5	.5	.5	.5	.7	.6	.6	1.7	1.5	1.4	.9	.6	.4	.4	.5	.4	.4	.4
.4	.4	.4	.4	.4	.4	.7	.8	.5	.5	.4	.4	.4	.4	.3	.3	.3	.6	.5	.5	.6	.6	.7	1.1	1.3	2.3	2.0	2.4	1.2	.5	.5	.5	.4	.4	.4	.4
.4	.4	.5	.3	.3	.3	.4	.7	.5	.6	.4	.2	.3	.3	.3	.3	.4	.6	.4	.6	.7	.6	.5	.8	.6	.5	.9	1.1	.7	.5	.5	.4	.3	.3	.3	.3
.3	.3	.6	.4	.3	.3	.3	.4	.4	.4	.5	.4	.3	.3	.3	.3	.5	.7	.4	.7	.7	.7	.7	.4	.2	.5	.3	.5	.5	.3	.6	.5	.4	.3	.3	.3
.6	.5	.5	.5	.5	.5	.5	.5	.4	.4	.7	.6	.5	.4	.5	.5	.5	.6	.6	.7	.7	.9	.6	.4	.3	.3	.4	.6	.5	.5	.6	.5	.7	.6	.6	.6
.5	.3	.3	.3	.3	.3	.3	.3	.3	.3	.9	1.0	1.0	.9	.7	.4	.3	.3	.5	1.1	1.1	1.1	.3	.5	.5	.5	.6	.6	.8	.8	.7	.7	.8	.7	.5	.5
.5	.5	.6	.3	.3	.3	.2	.2	.2	.2	.8	1.3	.9	.9	.5	.2	.2	.2	.2	.9	.9	.9	.7	.4	.4	.5	.5	.4	.3	.3	.7	.9	.7	.5	.4	.4
.3	.4	.5	.4	.3	.3	.3	.3	.3	.2	.4	1.4	.8	.7	.5	.3	.2	.2	.3	.7	1.1	.6	.6	.5	.3	.4	.3	.3	.3	.6	.9	.8	.7	.6	.4	.3
.4	.4	.3	.4	.4	.3	.3	.3	.3	.3	.5	1.0	.6	.4	.5	.4	.3	.3	.3	.4	.8	.6	.4	.3	.3	.4	.4	.3	.3	.5	.5	.5	.7	.6	.5	.6
.5	.4	.4	.4	.4	.4	.4	.4	.4	.3	.6	.6	.3	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.6
.4	.5	.4	.4	.5	.5	.5	.5	.4	.4	.5	.5	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.5	.7	.6	.6	.5	.4	.3	.4	.4	.4	.4	.5	.7	1.0	.7	.5	.7	.9	.9	.8	.9	1.0	.8	.6	.5	.4
.7	.7	.6	.6	.9	1.1	1.0	.9	.9	.9	.7	.7	.6	.5	.6	.8	1.0	1.6	2.0	2.3	2.4	2.3	2.3	2.1	1.9	1.9	2.1	2.4	2.3	2.0	1.8	1.6	1.3	1.3	.9	.8
.6	.5	.5	.6	.6	.8	.9	1.1	1.0	.6	.5	.6	.6	.6	.7	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.9	2.1	2.1	2.0	1.9	1.6	1.4	1.2	1.0	.9	1.1	.8	.6

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

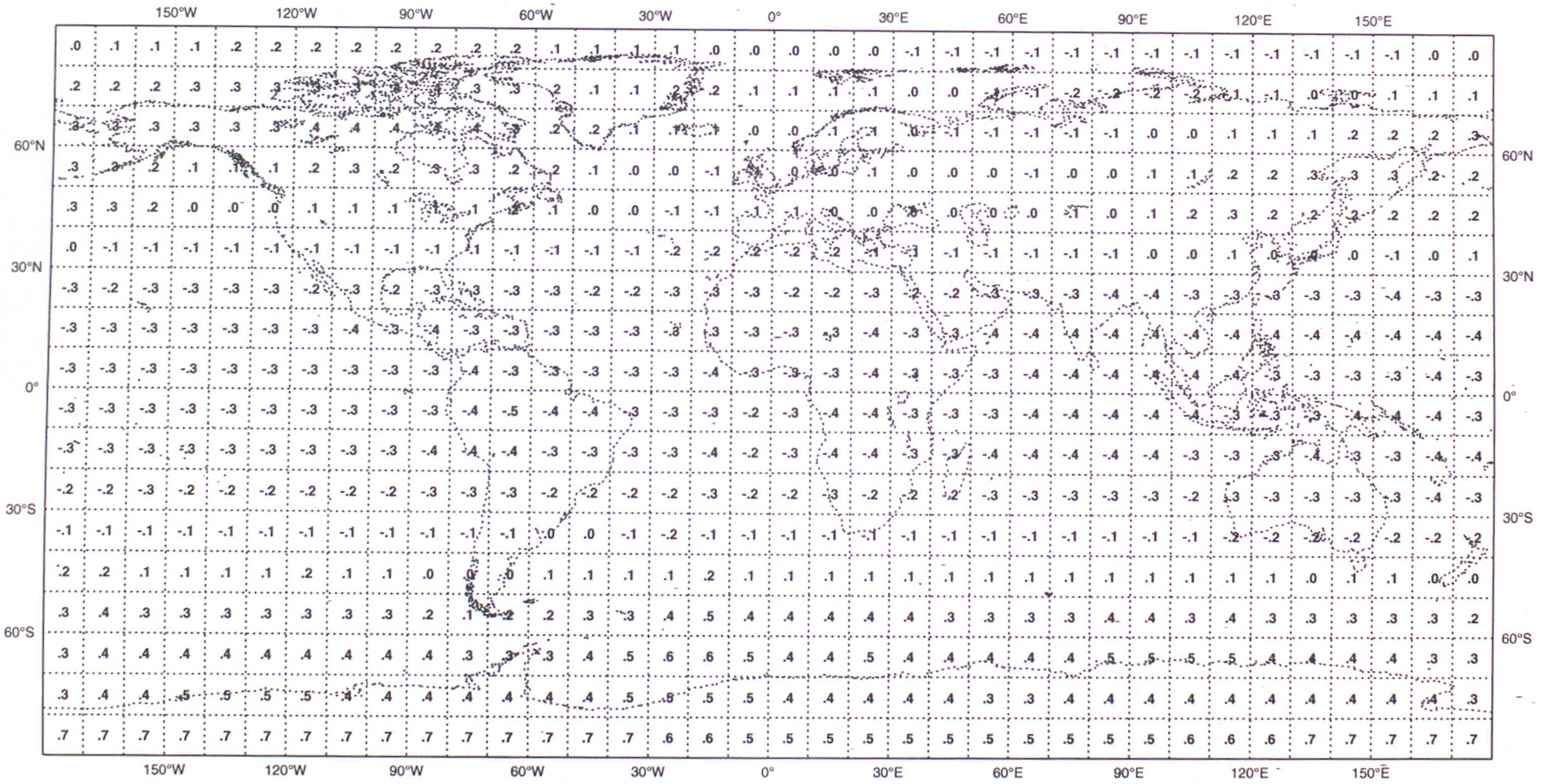

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.0 .1 .1 .1 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .1 .0 .0 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 .0
.2 .2 .2 .3 .3 .3 .3 .3 .3 .4 .3 .3 .2 .1 .1 .2 .2 .1 .1 .1 .1 .0 .0 -.1 -.1 -.2 -.2 -.2 -.2 -.1 -.1 .0 .0 .1 .1 .1
.3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .2 .2 .1 .1 .1 .0 .0 .1 .1 .0 -.1 -.1 -.1 -.1 -.1 .0 .0 .1 .1 .1 .2 .2 .2 .3
.3 .3 .2 .1 .1 .1 .2 .3 .2 .3 .3 .2 .2 .1 .0 .0 -.1 [illegible] .0 .0 .1 .0 .0 .0 -.1 .0 .0 .1 .1 .2 .2 .3 .3 .3 .2 .2
.3 .3 .2 .0 .0 .0 .1 .1 .1 .1 .1 .2 .1 .0 .0 -.1 -.1 -.1 -.1 .0 .0 .0 .0 .0 .0 -.1 .0 .1 .2 .3 .2 .2 .2 .2 .2 .2
.0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.2 -.2 -.2 -.2 -.2 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 .0 .1 .0 .0 .0 -.1 .0 .1
-.3 -.2 -.3 -.3 -.3 -.3 -.2 -.3 -.2 -.3 -.3 -.3 -.3 -.2 -.2 -.3 -.3 -.3 -.2 -.2 -.3 -.2 -.2 -.3 -.3 -.3 -.4 -.4 -.3 -.3 -.3 -.3 -.3 -.4 -.3 -.3
-.3 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.3 -.4 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4 -.4
-.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.3 -.3 -.3 -.3 -.3 -.4 -.3 -.3 -.3 -.4 -.3 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.3 -.3 -.3 -.3 -.4 -.3
-.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.5 -.4 -.4 -.3 -.3 -.3 -.2 -.3 -.4 -.4 -.3 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.4 -.3 -.3 -.3 -.4 -.4 -.3
-.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.4 -.4 -.3 -.3 -.3 -.3 -.4 -.2 -.3 -.4 -.4 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.3 -.3 -.3 -.4 -.3 -.3 -.4 -.4
-.2 -.2 -.3 -.2 -.2 -.2 -.2 -.2 -.2 -.3 -.3 -.3 -.2 -.2 -.2 -.2 -.3 -.2 -.2 -.3 -.2 -.2 -.2 -.3 -.3 -.3 -.3 -.3 -.3 -.2 -.3 -.3 -.3 -.3 -.4 -.3
-.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 .0 -.1 -.2 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.2
.2 .2 .1 .1 .1 .1 .2 .1 .1 .0 .0 .0 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .1 .1 .0 .0
.3 .4 .3 .3 .3 .3 .3 .3 .3 .2 .1 .2 .2 .3 .3 .4 .5 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .3 .4 .3 .3 .3 .3 .3 .2
.3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .5 .6 .6 .5 .4 .4 .5 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .3 .3
.3 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3
.7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .7 .7 .7 .7 .7

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

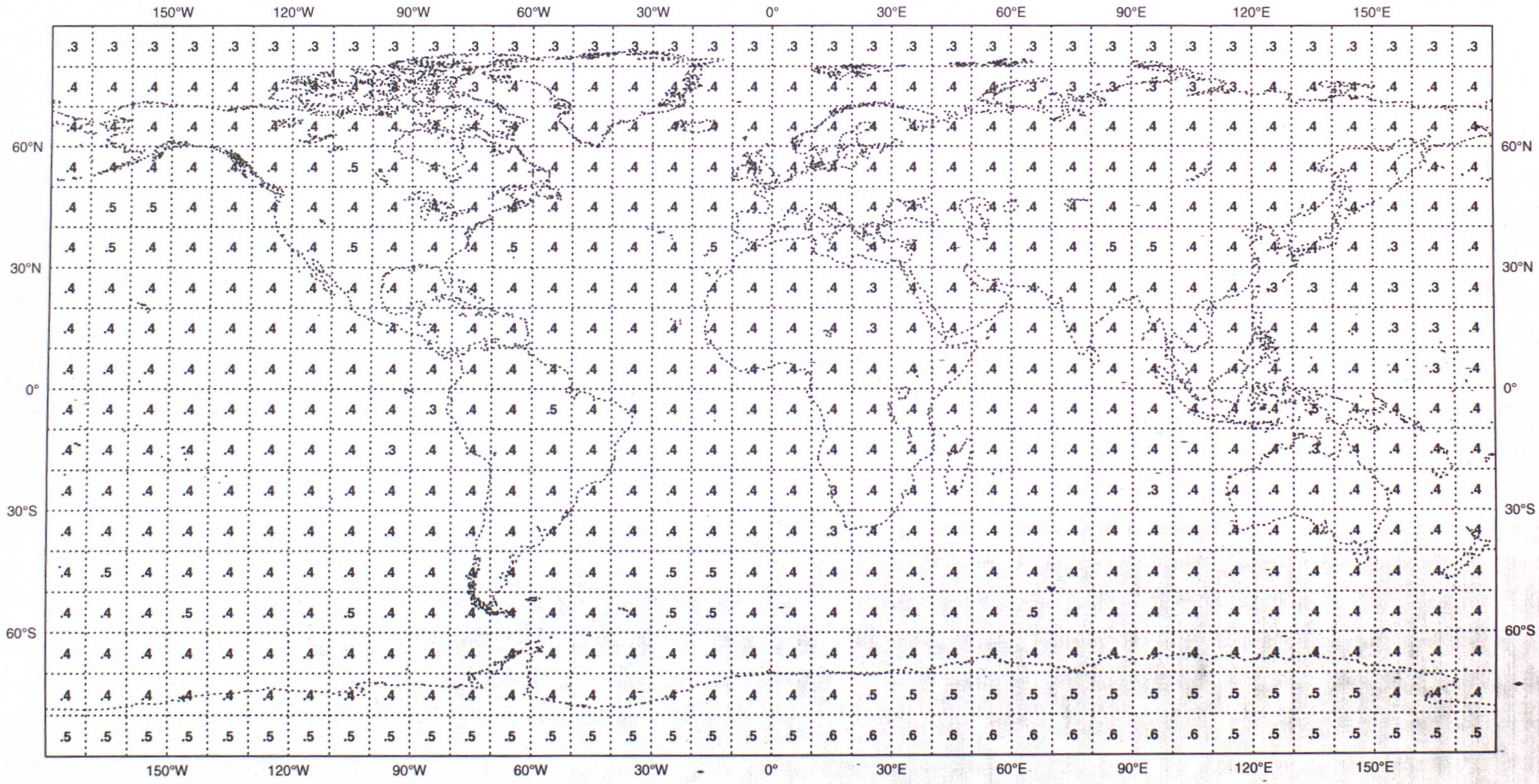

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

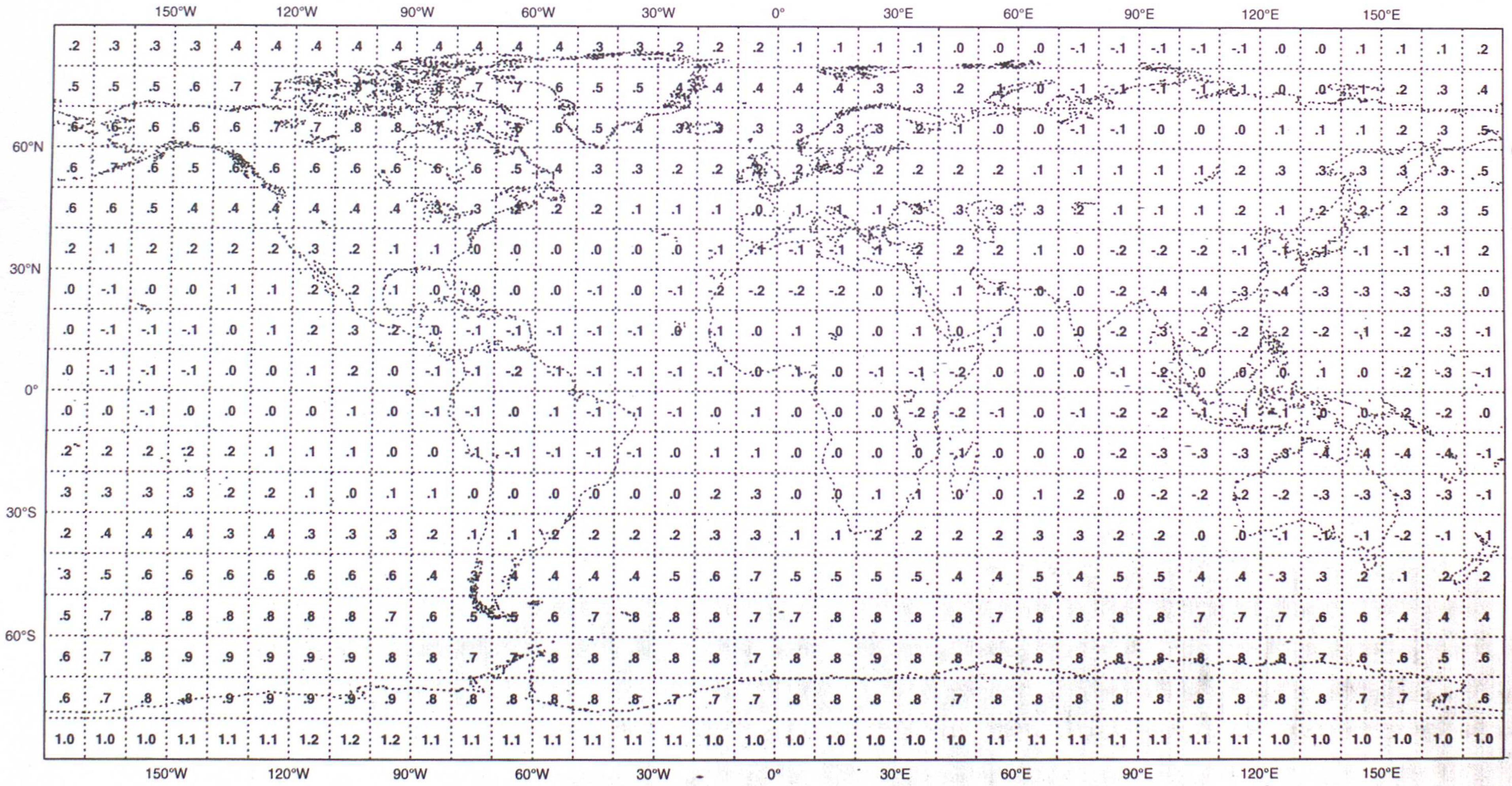

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

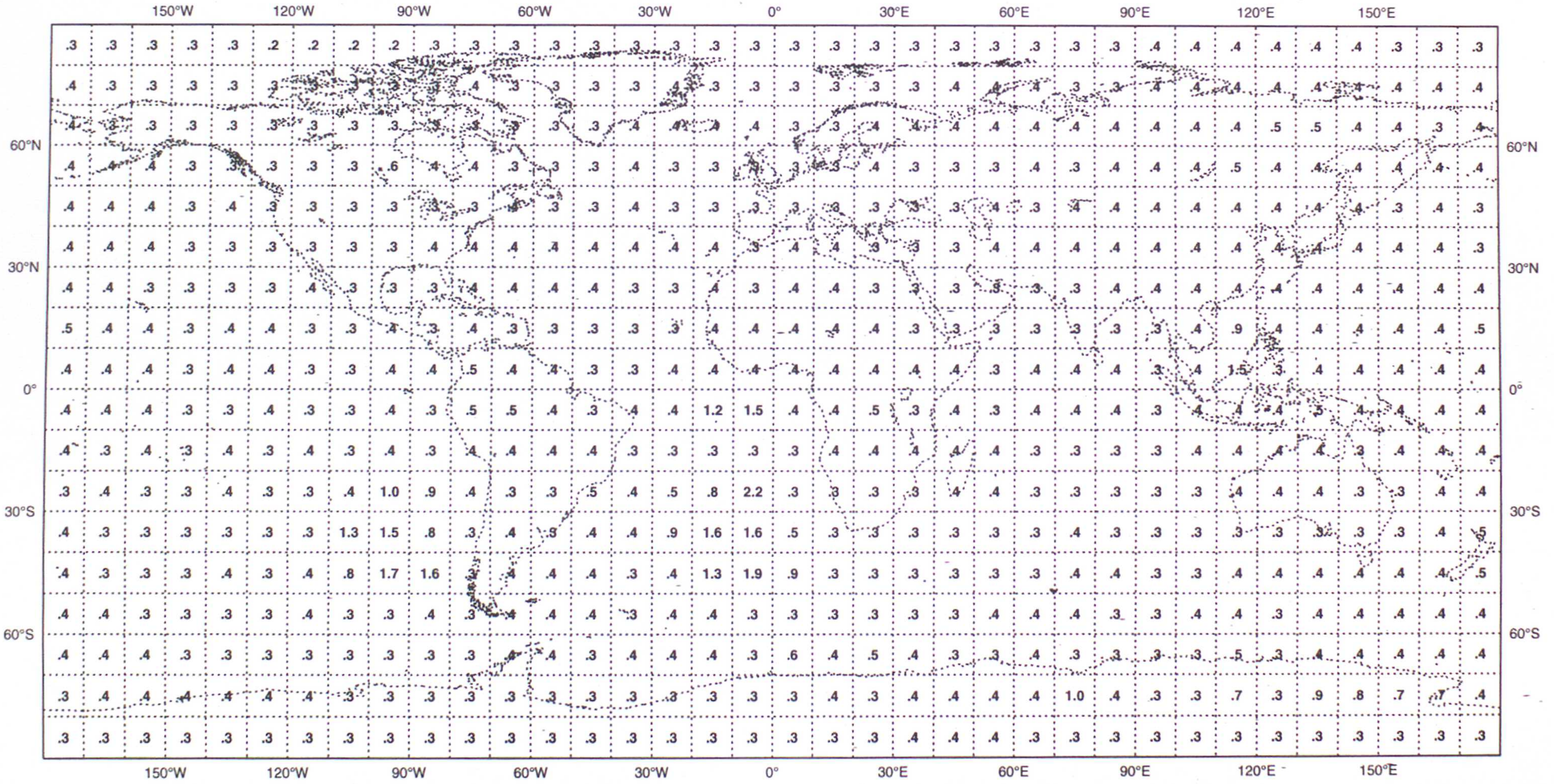

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .3 .3 .3 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .3 .4
.4 .4 .4 .3 .3 .3 .3 .3 .6 .4 .4 .3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .3 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4
.4 .4 .4 .3 .4 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .3
.4 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3
.4 .4 .3 .3 .3 .3 .4 .3 .3 .3 .4 .4 .4 .4 .3 .3 .4 .3 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .4 .4 .3 .4 .4 .3 .3 .4 .3 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .9 .4 .4 .4 .4 .4 .5
.4 .4 .4 .3 .4 .4 .3 .3 .4 .4 .5 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .3 .4 1.5 .3 .4 .4 .4 .4 .4
.4 .4 .4 .3 .3 .4 .3 .3 .4 .3 .5 .5 .4 .3 .4 .4 1.2 1.5 .4 .4 .5 .3 .4 .3 .4 .4 .4 .3 .4 .4 .4 .5 .4 .4 .4 .4
.4 .3 .4 .3 .4 .3 .4 .3 .4 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .3 .4 .4 .4
.3 .4 .3 .3 .4 .3 .3 .4 1.0 .9 .4 .3 .3 .5 .4 .5 .8 2.2 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .4 .4
.4 .3 .3 .3 .3 .3 .3 1.3 1.5 .8 .3 .4 .3 .4 .4 .9 1.6 1.6 .5 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .5
.4 .3 .3 .3 .4 .3 .4 .8 1.7 1.6 .3 .4 .4 .4 .3 .4 1.3 1.9 .9 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .5
.4 .4 .3 .3 .3 .3 .4 .3 .3 .4 .3 .4 .4 .4 .3 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .4 .4 .3 .4 .4 .4 .4 .4
.4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .4 .4 .4 .3 .6 .4 .5 .4 .3 .3 .4 .3 .3 .3 .3 .5 .3 .4 .4 .4 .4 .4
.3 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .4 .4 1.0 .4 .3 .3 .7 .3 .9 .8 .7 .7 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures **Period**		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13531	22.9	-23.8	P	675	0	0	0.5	0.2	0.6
13532	31.3	-14.3	P	668	0	0	0.5	0.1	0.5
13533	20.0	-30.3	P	673	0	0	0.5	0.2	0.5
13600	20.0	-35.2	P	455	0	10	0.5	0.9	1.0
13602	20.3	-38.1	P	399	0	0	0.5	0.2	0.5
41504	17.6	-80.9	P	1035	0	67	0.9	0.0	0.9
41520	11.5	-47.4	P	986	0	68	0.5	1.6	1.7
41534	26.9	-63.9	P	265	0	12	0.4	-0.3	0.5
41590	21.8	-63.4	P	493	0	0	0.4	1.0	1.1
41594	24.5	-42.7	P	525	0	0	0.5	-0.2	0.5
41595	26.2	-38.1	P	501	0	0	0.5	0.8	0.9
41600	36.3	-65.5	P	573	0	2	1.5	-0.1	1.5
41630	27.0	-70.7	P	484	0	15	0.7	0.3	0.8
41631	32.5	-74.5	P	419	0	2	1.1	0.4	1.2
41646	22.0	-75.1	P	435	0	1	0.9	0.4	1.0
41647	25.8	-83.0	P	440	0	1	0.7	0.6	0.9
41654	37.9	-10.8	P	3	0	33	0.2	-0.6	0.7
41655	22.4	-68.8	P	456	0	0	0.4	0.8	0.9
41666	29.2	-52.3	P	547	0	0	0.5	0.7	0.9
41907	28.1	-59.6	P	22	0	0	0.3	-1.0	1.1
41910	23.6	-72.9	P	38	0	0	0.4	0.2	0.5
41911	27.2	-64.4	P	16	0	0	0.4	-0.5	0.6
41913	22.4	-59.1	P	88	0	0	0.4	-0.6	0.7
41916	28.2	-59.2	P	226	0	0	0.5	0.1	0.5
44546	51.0	-28.4	P	543	0	1	1.3	0.1	1.3
44551	55.2	-22.9	P	663	0	1	1.0	0.7	1.3
44603	62.4	-22.5	P	880	0	27	1.0	0.4	1.1
44605	53.1	-18.6	P	687	0	3	0.8	0.1	0.8
44606	31.3	-61.6	P	681	0	5	0.6	-0.2	0.6
44608	35.5	-33.8	P	645	0	1	0.8	-0.2	0.8
44609	58.8	-10.1	P	962	0	39	1.3	-0.1	1.4
44611	63.0	-13.2	P	618	0	1	0.8	0.1	0.8
44612	52.9	-32.6	P	591	0	0	0.9	-0.1	0.9
44613	59.8	-20.7	P	613	0	2	0.7	-0.7	1.0
44614	62.6	-27.9	P	637	0	2	0.9	-0.2	0.9
44616	53.2	-41.0	P	34	32	76	4.9	-5.7	7.5
44617	49.8	-48.9	P	438	0	1	1.1	0.6	1.3
44621	60.1	-52.0	P	635	0	0	0.8	0.5	0.9
44623	29.7	-42.5	P	642	0	2	0.7	0.1	0.7
44624	50.8	-48.3	P	677	0	14	1.4	0.9	1.6
44625	56.2	-38.4	P	45	0	0	1.1	-0.6	1.3
44626	39.2	-62.8	P	653	1	5	1.4	0.7	1.6
44628	35.9	-29.0	P	603	0	3	1.4	-0.3	1.4
44630	34.1	-30.5	P	623	0	3	1.2	0.8	1.4
44742	44.3	-43.3	P	786	0	34	1.0	0.9	1.4
44743	50.4	-37.5	P	576	0	1	1.1	-0.2	1.1
44744	47.4	-34.8	P	673	0	2	1.3	0.3	1.4
44745	52.2	-32.3	P	685	0	3	1.0	0.1	1.0
44747	48.9	-30.6	P	535	0	1	1.3	-0.2	1.3
44761	53.8	-44.5	P	595	0	0	1.1	0.5	1.2
44762	54.3	-38.4	P	615	0	1	1.2	1.1	1.6
44765	40.6	-62.3	P	596	0	10	1.0	-0.4	1.1
44766	47.8	-32.1	P	554	0	0	1.2	0.2	1.2
44768	57.9	-48.3	P	35	9	63	3.4	5.3	6.3
44770	57.6	-9.4	P	102	0	25	0.8	-0.3	0.8
44771	49.7	-21.3	P	223	0	29	0.8	-0.2	0.8
44772	56.3	-43.6	P	403	0	34	1.8	-0.6	1.9
44773	60.3	-32.7	P	324	0	23	1.0	0.0	1.0
44777	31.3	-20.8	P	198	0	16	0.7	0.0	0.7
44778	40.1	-21.5	P	272	1	18	0.7	0.2	0.7
44780	58.3	-28.4	P	527	0	37	1.0	-0.2	1.1
62513	31.6	-18.6	P	499	7	13	1.6	0.5	1.7

62514	32.9	-26.6	P	669	0	1	1.0	0.6	1.2
62515	22.0	-62.3	P	678	0	0	0.4	0.0	0.4
62517	29.1	-31.2	P	669	0	1	0.5	-0.6	0.8
62551	39.0	-23.9	P	781	0	16	0.7	0.2	0.7
62552	33.5	-21.7	P	669	0	0	0.6	0.8	1.0
62574	48.2	-8.1	P	549	0	1	0.6	0.6	0.9
62712	58.8	-17.1	P	617	0	2	0.7	0.2	0.7
62801	38.1	-17.6	P	589	0	1	0.6	0.6	0.8
62804	45.7	-5.6	P	843	0	28	0.7	-0.3	0.7
64523	67.2	-21.0	P	687	0	11	2.4	-0.7	2.5
65597	56.3	-52.7	P	432	1	33	1.8	-0.3	1.8
65598	57.3	-44.8	P	372	1	37	2.3	-1.3	2.6
65599	57.6	-43.6	P	343	0	26	1.2	0.0	1.2

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
018114	19.8	-17.4	SPEED	1	0	100	0.0	6.7	6.7
13600	20.0	-35.2	SPEED	451	0	100	1.0	-0.8	1.3
13602	20.3	-38.1	SPEED	396	0	100	1.2	-0.7	1.4
41590	21.8	-63.4	SPEED	490	0	100	1.5	-0.9	1.7
41594	24.5	-42.7	SPEED	502	0	100	1.1	-0.8	1.4
41595	26.2	-38.1	SPEED	482	0	100	1.3	-1.1	1.7
41647	25.8	-83.0	SPEED	404	0	100	3.8	2.8	4.7
44546	51.0	-28.4	SPEED	544	0	100	2.8	-0.1	2.8
44551	55.2	-22.9	SPEED	583	0	100	2.3	0.1	2.3
62574	48.2	-8.1	SPEED	490	0	100	1.9	-1.3	2.3

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
018114	19.8	-17.4	DIRN.	1	0	0	0.0	51.9	51.9
13600	20.0	-35.2	DIRN.	227	0	0	9.8	-10.2	14.1
13602	20.3	-38.1	DIRN.	199	0	0	11.6	-12.7	17.2
41590	21.8	-63.4	DIRN.	207	0	0	18.4	-0.2	18.4
41594	24.5	-42.7	DIRN.	247	0	0	15.5	-4.7	16.2
41595	26.2	-38.1	DIRN.	248	0	0	18.2	-35.9	40.2
41647	25.8	-83.0	DIRN.	259	0	0	19.2	-0.8	19.2
44546	51.0	-28.4	DIRN.	446	0	0	16.7	20.6	26.5
44551	55.2	-22.9	DIRN.	503	0	0	18.4	-0.2	18.4
62574	48.2	-8.1	DIRN.	377	0	0	11.9	2.5	12.2

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	556	1	8	1.5	-0.1	479	0	9	0	7.7	1.0
ACA	618	0	2	1.8	-0.3	609	0	3	0	7.7	0.5
AEA	197	0	2	1.5	0.3	101	1	7	0	9.6	0.7
AEL	390	1	8	1.6	-0.3	318	0	9	0	7.9	0.4
AEW	75	1	4	1.2	-0.5	75	0	1	0	6.3	1.5
AFL	328	1	3	1.7	0.6	313	0	5	0	8.2	0.5
AFR	675	0	6	1.7	0.3	571	0	7	0	8.1	0.7
AJM	224	0	3	1.5	-0.4	207	0	1	0	5.8	0.9
AMT	38	0	8	1.7	0.7	38	0	13	0	7.7	0.8
AMX	186	1	2	1.6	0.2	129	2	69	0	9.5	0.1
ATN	38	3	100	4.2	-1.1	38	0	5	0	10.0	-0.1
AZA	243	0	4	1.7	-0.1	222	0	5	0	9.0	1.5
BAL	164	0	9	1.5	0.4	151	0	12	0	8.0	1.3
BAW	506	1	19	1.8	-0.6	499	0	19	0	7.5	0.7
BPA	261	0	63	1.9	0.0	212	0	11	0	9.4	-0.4
BSK	46	2	2	1.4	-0.2	47	0	15	0	12.2	0.4
BWA	114	1	4	1.5	-0.4	80	0	4	0	7.5	0.8
CFC	48	0	10	1.7	-0.1	51	0	12	0	9.5	1.7
CFG	495	1	3	1.4	-0.3	434	0	4	0	7.3	0.5
CKS	130	2	13	1.8	0.6	129	2	12	0	8.0	1.0
CLX	246	0	3	1.6	-0.7	221	0	3	0	6.5	0.3
COA	84	0	35	1.5	-0.4	44	0	36	0	7.3	1.3
CRL	390	1	5	1.6	0.5	281	0	5	0	8.1	0.9
CUB	96	0	3	2.0	-0.7	82	0	7	0	9.4	1.3
DAL	665	0	5	1.6	-0.3	627	0	8	0	8.5	0.9
DCS	35	3	3	1.2	-0.4	35	0	0	0	5.3	2.0
DHL	120	0	100	6.3	-6.0	119	0	100	0	12.4	1.0
DLH	493	0	9	1.5	0.1	496	1	11	0	7.1	0.4
EDW	54	0	2	1.7	-0.3	48	2	8	0	10.2	0.5
EEZ	67	0	4	1.3	-0.2	60	0	5	0	5.6	1.6
EIA	209	5	100	3.5	1.4	196	1	100	0	22.8	10.3
ELY	165	1	3	1.5	-0.1	170	0	6	0	8.2	1.0
FCA	69	0	1	1.8	0.8	57	2	5	0	9.2	1.0
FDX	512	1	31	1.3	0.1	515	0	32	0	9.2	0.9
FIN	217	0	5	1.7	0.1	212	0	6	0	6.3	0.5
FWI	251	0	5	1.9	-0.3	229	0	6	0	8.4	1.1
GAF	47	0	2	1.9	-0.9	49	2	2	0	6.6	1.2
GCO	116	1	4	1.7	0.5	117	1	10	0	12.1	0.4
GRL	69	0	10	2.5	1.0	65	0	0	0	5.5	1.5
GTI	151	1	11	1.5	0.3	149	0	11	0	7.9	1.4
HLN	123	0	15	1.7	0.3	108	0	15	0	6.8	0.8
HXL	22	0	27	1.0	-0.2	22	0	23	0	7.1	2.3
IBE	983	1	5	1.5	0.3	660	0	7	0	8.2	1.1
ICE	653	1	3	1.6	-0.4	639	0	4	0	7.8	0.8
IRL	24	0	0	2.1	1.7	24	0	0	0	4.8	0.5
IWD	47	0	4	1.2	-0.3	27	0	7	0	9.7	0.2
KLM	793	1	3	1.7	-0.1	747	0	3	0	8.4	0.5
LAN	37	3	11	1.5	0.6	39	0	13	0	7.7	0.9
LDA	45	9	58	5.2	3.8	40	0	15	0	10.8	0.3
LDI	292	0	2	1.5	0.1	246	0	4	0	8.1	0.4
LOT	112	0	4	2.0	-1.3	109	0	3	0	7.8	0.0
LTU	597	0	7	1.7	-0.2	518	0	7	0	7.5	1.3
MAS	20	0	0	1.7	0.0	20	0	0	0	4.2	0.0
MON	65	0	9	2.9	0.7	62	2	5	0	9.0	1.9
MPD	83	1	4	1.7	0.3	54	2	2	0	6.3	1.2
MPH	417	0	3	1.9	-0.7	392	1	5	0	9.4	0.3
MYT	140	1	5	2.2	0.7	131	2	2	0	6.4	1.5
NCA	29	0	0	1.5	0.7	27	0	4	0	7.5	0.7
NWA	1797	1	3	1.7	0.5	1790	0	3	0	7.4	0.5

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
OAE	150	2	11	1.8	-0.1	144	0	75	0	19.7	5.5
PAC	193	1	6	1.8	-0.1	196	1	8	0	8.0	0.4
PHA	25	0	8	1.7	0.1	22	0	9	0	7.6	-0.4
RAM	201	0	5	2.2	0.3	141	0	45	0	10.2	1.8
RCH	357	1	100	3.3	-0.5	299	0	100	0	11.8	1.3
RRR	46	24	35	1.9	0.0	45	0	13	0	8.4	0.8
RZO	106	0	3	1.7	-0.3	82	0	2	0	6.6	0.9
SEU	324	1	6	1.9	0.0	288	0	4	0	7.6	1.2
SHE	30	0	7	2.4	1.4	30	0	10	0	9.3	1.2
TAP	185	1	5	1.8	-0.5	113	0	4	0	8.4	0.8
UAL	381	0	70	2.3	-1.2	384	1	71	0	8.9	1.1
UPS	1045	1	45	1.4	0.0	1005	0	46	0	8.0	0.6
USA	131	1	3	1.4	0.0	112	0	4	0	7.7	1.0
VIR	93	0	2	1.6	-0.1	92	0	5	0	7.5	0.6
WOA	350	1	8	1.6	0.2	345	0	10	0	8.0	1.2
XLA	89	0	6	1.2	0.2	72	0	8	0	8.8	1.5

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
EU	29891	0	18	1.3	0.1	29891	0	17	0	4.8	0.6
TN	35	0	14	3.2	1.1	36	0	17	0	9.2	1.3

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	449	4	8	2.3	0.1	448	0	4	0	7.5	1.1
US ACARS	16738	0	26	1.4	0.1	16738	0	24	0	5.1	0.8

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	7	0	24.8	24.8	-0.3
DBBH	12	Z	100	18	0	11.3	17.2	12.9
EBUQ	12	Z	100	11	0	14.5	19.3	12.7
ELML7	00	Z	100	4	0	6.1	12.1	10.5
ELML7	12	Z	100	5	0	13.2	35.2	32.6
FQFL	00	Z	100	5	0	33.4	33.8	5.6
FQFL	12	Z	100	5	0	27.8	28.0	-3.2
FQFM	00	Z	100	6	0	32.2	33.6	-9.7
FQFM	12	Z	100	9	0	19.6	22.0	9.9
KHRH	00	Z	100	6	0	19.3	27.3	19.3
KHRH	12	Z	100	6	0	32.6	47.1	34.0
KRPD	00	Z	100	3	0	7.8	7.8	0.0
KRPD	12	Z	100	5	0	9.9	12.7	8.0
LDWR	00	Z	100	28	0	8.8	27.0	-25.6
LDWR	12	Z	100	27	0	10.8	31.5	-29.6
OXTS2	00	Z	100	12	0	13.1	19.0	-13.8
OXTS2	12	Z	100	9	0	14.6	17.3	-9.3
OXYH2	00	Z	100	4	0	13.7	22.4	-17.8
OXYH2	12	Z	100	9	0	14.8	15.2	-3.8
PACDG	00	Z	100	2	1	4.0	5.0	3.0
PACDG	12	Z	100	1	0	0.0	25.0	25.0
V2XM	12	Z	100	1	0	0.0	4.0	4.0
WAAH	00	Z	100	6	0	13.8	19.5	13.8
WAAH	12	Z	100	6	0	3.1	3.3	-1.0
WPKD	00	Z	100	9	0	8.9	10.0	4.6
WPKD	12	Z	100	5	0	7.2	14.7	12.8
ZCBP6	00	Z	100	7	0	29.9	43.9	32.1
ZCBP6	12	Z	100	9	0	17.4	37.6	33.3
03953	00	Z	100	28	0	14.8	14.9	1.8
03953	12	Z	100	28	0	16.0	16.9	5.3
04018	00	Z	100	23	0	11.4	15.5	-10.5
04018	12	Z	100	27	0	19.3	20.2	-5.7
04220	00	Z	100	27	0	13.9	26.7	-22.8
04220	12	Z	100	26	0	10.1	30.3	-28.6
04270	00	Z	100	26	1	12.1	19.8	-15.7
04270	12	Z	100	26	0	10.0	20.1	-17.4
04339	00	Z	100	26	0	7.8	20.4	-18.8
04339	12	Z	100	28	0	11.3	19.8	-16.3
04360	00	Z	100	27	0	13.3	23.2	-19.0
04360	12	Z	100	27	0	14.3	23.9	-19.2
08001	00	Z	100	23	0	22.4	24.6	-10.2
08001	12	Z	100	28	0	20.3	22.4	-9.3
08508	12	Z	100	26	0	23.6	32.9	22.9
08522	12	Z	100	25	0	13.3	19.0	13.6
08594	12	Z	100	22	0	16.7	25.7	19.5
71600	00	Z	100	28	0	12.6	20.2	-15.7
71600	12	Z	100	28	0	14.6	23.5	-18.5
72201	00	Z	100	28	0	10.2	20.2	17.4
72201	12	Z	100	28	0	11.3	18.1	14.1
72402	00	Z	100	28	0	15.5	26.5	21.5
72402	12	Z	100	28	0	13.2	21.9	17.5
74494	00	Z	100	26	0	24.1	25.6	-8.7
74494	12	Z	100	25	0	13.9	27.9	-24.1
78016	00	Z	100	27	0	11.1	27.9	25.6
78016	12	Z	100	22	0	14.2	35.5	32.5

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	7	0	30.0	33.8	-15.6
DBBH	12	Z	500	18	0	7.0	7.5	-2.7
EBUQ	12	Z	500	12	0	6.7	7.4	-3.1
ELML7	00	Z	500	4	0	8.0	8.0	-0.3
ELML7	12	Z	500	6	0	11.0	13.1	7.2
FQFL	00	Z	500	7	0	17.3	19.8	-9.7
FQFL	12	Z	500	8	0	13.3	13.9	-4.1
FQFM	00	Z	500	7	0	11.7	19.2	-15.1
FQFM	12	Z	500	10	0	10.6	12.1	-5.9
KHRH	00	Z	500	6	0	14.3	21.2	15.7
KHRH	12	Z	500	7	0	33.2	46.8	33.0
KRPD	00	Z	500	3	0	6.5	6.6	-1.0
KRPD	12	Z	500	6	0	10.1	11.3	5.2
LDWR	00	Z	500	28	0	7.3	8.3	-4.0
LDWR	12	Z	500	27	0	9.2	10.4	-4.9
OXTS2	00	Z	500	12	0	11.7	11.8	1.3
OXTS2	12	Z	500	9	0	7.6	8.9	4.7
OXYH2	00	Z	500	4	1	6.7	7.2	2.8
OXYH2	12	Z	500	9	0	8.4	13.9	11.1
PACDG	00	Z	500	8	0	8.4	9.1	3.4
PACDG	12	Z	500	1	0	0.0	14.0	14.0
V2XM	00	Z	500	2	0	11.5	14.9	-9.5
V2XM	12	Z	500	2	0	7.5	8.3	-3.5
WAAH	00	Z	500	6	0	11.9	12.6	4.2
WAAH	12	Z	500	7	0	19.7	20.9	7.1
WPKD	00	Z	500	9	0	8.0	10.8	-7.2
WPKD	12	Z	500	6	0	5.1	5.3	1.2
ZCBP6	00	Z	500	8	0	9.0	29.2	27.8
ZCBP6	12	Z	500	10	0	9.8	34.3	32.9
03953	00	Z	500	28	0	7.6	8.1	2.8
03953	12	Z	500	28	0	9.6	12.9	8.6
04018	00	Z	500	25	0	9.4	11.0	5.7
04018	12	Z	500	27	0	18.4	19.8	7.5
04220	00	Z	500	27	0	9.0	9.5	2.9
04220	12	Z	500	27	0	9.6	9.9	2.4
04270	00	Z	500	26	1	10.8	10.8	0.7
04270	12	Z	500	27	0	7.0	7.4	2.6
04339	00	Z	500	27	0	10.9	12.0	5.1
04339	12	Z	500	28	0	10.4	12.6	7.1
04360	00	Z	500	27	0	9.9	11.5	5.8
04360	12	Z	500	27	0	9.6	10.6	4.6
08001	00	Z	500	24	0	11.7	12.6	-4.8
08001	12	Z	500	28	0	10.1	10.5	-2.9
08508	12	Z	500	26	0	12.4	12.5	1.7
08522	12	Z	500	27	0	8.4	9.4	4.3
08594	12	Z	500	24	0	5.1	5.3	-1.3
71600	00	Z	500	28	0	12.5	15.5	-9.2
71600	12	Z	500	28	0	10.1	11.9	-6.2
72201	00	Z	500	28	0	7.0	7.4	-2.4
72201	12	Z	500	28	0	6.4	9.4	-7.0
72402	00	Z	500	28	0	7.6	8.7	4.2
72402	12	Z	500	28	0	6.6	6.6	0.9
74494	00	Z	500	28	0	24.6	25.6	-6.9
74494	12	Z	500	27	0	6.9	8.5	-5.0
78016	00	Z	500	28	0	8.0	10.1	6.3
78016	12	Z	500	26	0	17.5	17.7	2.6

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	7	0	0	5.4	0.2	-2.7
DBBH	12	V	100	17	0	0	4.9	-0.6	-1.0
EBUQ	12	V	100	10	0	0	6.6	-2.0	2.0
ELML7	00	V	100	4	0	0	3.7	0.2	-3.3
ELML7	12	V	100	5	0	0	2.6	-0.6	0.5
FQFL	00	V	100	5	0	0	5.8	0.2	-0.5
FQFL	12	V	100	4	0	0	5.5	2.0	-1.9
FQFM	00	V	100	5	0	0	3.7	0.7	0.2
FQFM	12	V	100	9	0	0	5.1	-1.4	-0.4
KHRH	00	V	100	5	0	0	10.0	-0.4	0.9
KHRH	12	V	100	6	0	16	10.3	-0.2	-1.0
KRPD	00	V	100	1	0	0	5.5	-5.2	1.8
KRPD	12	V	100	4	0	0	9.5	-5.8	4.0
LDWR	00	V	100	28	0	0	3.0	0.8	-0.8
LDWR	12	V	100	27	0	0	3.6	1.0	-0.7
OXTS2	00	V	100	9	0	0	4.0	0.7	-0.7
OXTS2	12	V	100	6	0	0	5.9	0.8	-3.0
OXYH2	00	V	100	2	0	50	13.6	10.0	4.6
OXYH2	12	V	100	4	0	0	2.6	0.8	0.9
V2XM	12	V	100	1	0	0	2.1	1.6	1.3
WAAH	00	V	100	4	0	0	8.2	2.1	3.1
WAAH	12	V	100	2	0	0	9.9	6.5	7.5
WPKD	00	V	100	8	0	0	3.3	1.0	-0.1
WPKD	12	V	100	5	0	0	4.4	-0.9	-0.5
ZCBP6	00	V	100	5	0	0	3.6	0.0	1.2
ZCBP6	12	V	100	7	0	0	4.8	1.1	1.4
03953	00	V	100	28	0	0	3.2	0.6	0.6
03953	12	V	100	28	0	0	2.7	0.4	0.2
04018	00	V	100	23	0	0	3.6	1.0	-0.8
04018	12	V	100	27	0	0	3.3	0.3	0.5
04220	00	V	100	27	0	0	3.0	-0.3	-0.1
04220	12	V	100	25	0	0	2.6	0.6	0.0
04270	00	V	100	27	0	0	3.5	-0.1	0.0
04270	12	V	100	26	0	0	4.0	0.0	-0.5
04339	00	V	100	20	0	0	5.7	-0.5	-0.6
04339	12	V	100	24	0	0	5.3	0.9	-0.4
04360	00	V	100	27	0	0	4.0	0.6	0.1
04360	12	V	100	27	0	0	3.3	-0.1	-1.1
08001	00	V	100	22	0	0	3.7	1.0	-0.4
08001	12	V	100	26	0	0	4.4	-0.5	0.4
08508	12	V	100	12	0	0	3.2	-0.3	0.4
08522	12	V	100	23	0	0	5.0	0.7	1.2
08594	12	V	100	21	0	100	5.8	-0.5	2.9
71600	00	V	100	28	0	0	4.2	0.1	0.3
71600	12	V	100	28	0	0	4.9	0.6	-1.3
72201	00	V	100	28	0	0	3.9	-0.2	0.3
72201	12	V	100	28	0	0	4.4	0.2	-0.6
72402	00	V	100	28	0	0	4.4	0.9	-0.4
72402	12	V	100	28	0	0	6.1	1.7	-2.0
74494	00	V	100	25	0	100	4.8	-0.9	0.9
74494	12	V	100	23	0	100	4.8	-0.4	0.6
78016	00	V	100	24	0	4	6.1	-0.7	-2.1
78016	12	V	100	19	0	0	5.3	-1.1	0.4

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Feb 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	7	0	0	3.3	0.2	0.2
DBBH	12	V	500	17	0	0	3.7	0.4	0.1
EBUQ	12	V	500	11	0	0	4.6	-0.1	0.8
ELML7	00	V	500	4	0	0	4.0	1.8	-1.1
ELML7	12	V	500	5	0	0	4.5	-0.4	0.8
FQFL	00	V	500	7	0	0	4.5	-0.2	-0.1
FQFL	12	V	500	8	0	0	8.2	-0.2	-2.1
FQFM	00	V	500	7	0	0	2.7	-0.6	0.2
FQFM	12	V	500	10	0	0	5.6	1.4	1.7
KHRH	00	V	500	3	0	0	7.5	1.2	0.4
KHRH	12	V	500	4	0	0	10.6	-0.8	2.1
KRPD	00	V	500	2	0	50	14.3	-6.3	-7.9
KRPD	12	V	500	4	0	0	7.9	-6.5	-1.6
LDWR	00	V	500	28	0	3	6.2	0.2	0.0
LDWR	12	V	500	27	0	0	4.2	0.1	-0.5
OXTS2	00	V	500	10	1	0	6.0	1.6	-0.2
OXTS2	12	V	500	7	0	0	5.6	2.4	0.7
OXYH2	00	V	500	2	0	0	6.3	-3.9	-3.6
OXYH2	12	V	500	6	0	0	3.7	-1.2	1.5
PACDG	00	V	500	5	0	0	2.6	-1.0	-0.2
V2XM	00	V	500	2	0	0	5.7	2.7	4.2
V2XM	12	V	500	2	0	0	5.2	-1.9	-1.0
WAAH	00	V	500	3	0	0	10.5	-0.4	2.5
WAAH	12	V	500	3	0	0	5.9	4.8	-1.3
WPKD	00	V	500	9	0	0	4.9	-0.2	-1.5
WPKD	12	V	500	6	0	0	3.3	-0.7	0.7
ZCBP6	00	V	500	8	0	0	7.6	0.3	1.1
ZCBP6	12	V	500	8	0	0	5.3	1.1	-2.0
03953	00	V	500	28	0	0	4.1	-0.8	-0.8
03953	12	V	500	28	0	0	5.5	0.2	-0.6
04018	00	V	500	25	0	0	5.5	0.6	-0.8
04018	12	V	500	27	0	0	4.6	0.4	0.5
04220	00	V	500	27	0	0	3.8	0.0	0.4
04220	12	V	500	25	0	0	4.5	-0.2	-0.4
04270	00	V	500	27	0	0	5.6	-1.2	0.4
04270	12	V	500	27	0	0	4.6	0.0	1.6
04339	00	V	500	22	0	0	5.6	2.2	-0.4
04339	12	V	500	26	0	0	6.8	-0.6	-0.3
04360	00	V	500	27	0	0	5.6	0.1	-1.6
04360	12	V	500	27	0	0	5.4	-0.8	0.1
08001	00	V	500	24	0	0	4.1	0.6	-1.0
08001	12	V	500	27	0	0	3.6	0.8	-0.6
08508	12	V	500	12	0	0	3.8	-0.2	-0.5
08522	12	V	500	26	0	0	4.4	0.1	0.5
08594	12	V	500	24	0	100	6.5	0.6	3.9
71600	00	V	500	28	0	0	4.9	-0.3	0.0
71600	12	V	500	28	0	0	4.0	0.8	-0.5
72201	00	V	500	28	0	0	3.3	-0.7	0.3
72201	12	V	500	27	0	0	3.5	-0.4	-0.2
72402	00	V	500	28	0	0	4.1	0.8	0.6
72402	12	V	500	28	0	0	3.4	1.0	0.5
74494	00	V	500	28	0	100	3.5	-0.9	0.8
74494	12	V	500	27	0	100	3.8	-0.5	1.1
78016	00	V	500	28	0	0	4.2	1.1	0.6
78016	12	V	500	25	0	0	5.4	1.1	0.5

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45